

Environmental Assessment for Type III Fuel Hydrant System

at

Grissom Air Reserve Base



October 2011

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE OCT 2011		2. REPORT TYPE		3. DATES COVERED 00-00-2011 to 00-00-2011	
4. TITLE AND SUBTITLE Environmental Assessment for Type III Fuel Hydrant System at Grissom Air Reserve Base				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) 434 Mission Support Group (434 MSG/CEV),Grissom ARB,IN,46971				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 73	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

FINDING OF NO SIGNIFICANT IMPACT

1.0 NAME OF IMPACT

Replacement of the current 1800 gallon per minute (gpm) Type II jet fuel hydrant system with a new 1800 gpm Type III jet fuel system.

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

The Proposed Action consists of the construction of a 1,800 gallon per minute (GPM) jet fuel (JP-8) hydrant system. The work includes the installation of up to 2,356 meters (8,000 feet) of eight inch coated carbon steel pipe to transfer the JP-8 from the bulk storage facilities to the hydrant tanks and the installation of 1,160 meters (3,820 feet) of twelve inch coated carbon steel pipe composing the hydrant system. A new pumphouse will be constructed in the bulk storage yard to replace the existing pumphouse 404. This pumphouse will include four offload stands and two fillstands and a fuel recovery system. The fuel recovery system will include a 4,000 gal underground tank, located north of the building. A new pumphouse will also be constructed on the airfield to replace the existing pumphouse 736. This pumphouse will include two 475,000 liter (2,500 Barrel) storage tanks with concrete secondary containment, a fuel recovery system and a hydrant hose truck checkout stand. The fuel recovery system will include a 4,000 gal underground tank located to the west of the building

Pumphouse 404 and existing truck fill and load fill stands will be demolished including associated piping equipment, slabs and foundation to four feet below grade. Abandoned piping left in place will be cleaned and grouted before abandonment. Pumphouse 736 will be demolished including associated piping equipment, slabs and foundation to four feet below grade including the removal of the six 267,000 liter (50,000 gal) underground storage tanks. The existing transfer pipeline from the bulk storage facility to the hydrant pumphouse will be drained, cleaned, demolished, and filled with grout before it is abandoned in place. The existing hydrant lateral piping will be drained, cleaned, demolished, and filled with grout before it is abandoned in place. All associated pits, valves, and structures will be demolished to four feet below grade and backfilled to grade.

ALTERNATIVE 1

Shut down existing system and remodel existing pumphouses and existing transfer pipeline. An alternative to constructing two new pumphouses was considered. Under this alternative the original pumphouses would have been remodeled instead of demolished. However this would require the complete shutdown of the existing system causing all loading and offloading of the planes to be conducted by hand with R-11 trucks. Grissom currently has three R-11 refuelers assigned for supporting refueling operations. Normal KC-135 generation requires an average of three R-11s per aircraft. Using the R-11s to refuel the aircraft adds an additional 45 to one hour increase over the use of the hydrant. This mode also requires an increase in manpower to conduct these operations. Instead of five personnel required to use the hydrant; seven are required to refuel using an R-11. This is not only time

consuming it would cause long delays during this process. While remodeling the existing pumphouses the existing transfer pipeline would be removed and a new one installed.

This alternative was not deemed feasible because the existing hydrant system needs to remain active to meet mission requirements during the construction of the new system. While some money might be saved by remodeling the pumphouses verses building new ones; the additional costs associated this alternative would far outweigh the benefits. This alternative was not deemed feasible and will not be carried forward for detailed analysis in the EA. Therefore, other than the No Action Alternative, no alternative to the Proposed Action was identified.

NO ACTION ALTERNATIVE

Under the No Action Alternative, the Proposed Action would not be implemented and construction activities described herein would not be conducted. The current system, which is over 50 years old, would continue experience outages which will increase in frequency and duration. Failure to construct the new Type III Fuel Hydrant System would negatively impact the ability of the 434 ARW to carry out its mission.

3.0 SUMMARY OF ENVIRONMENTAL EFFECTS

Environmental analysis of land use resources, air quality, water resources, health and safety, hazardous materials/waste, biological resources, cultural resources, socioeconomic resources, and earth resources indicates the Proposed Action would not significantly affect these areas. During the construction phase some of the above areas would see minor impacts. For example, construction and demolition activities will generate solid waste and this would use up landfill space. Soil and vegetation will be disturbed in multiple locations, but soil and vegetation will also be restored in other areas. Once the construction phase is completed the new system will greatly reduce the risk of system leaks, which is beneficial for the Base and the surrounding environment. Based on the Environmental Assessment (EA), the potential impacts from the Proposed Action on the natural and man-made environment would be negligible.

4.0 FINDING OF NO SIGNIFICANT IMPACT

The EA for the Type III Fuel Hydrant System at Grissom Air Reserve Base was evaluated according to the *National Environmental Policy Act of 1969* and Air Force Instruction 32-7061, the *Environmental Impact Analysis Process*. The environmental assessment concluded that no significant impact would result from the Proposed Action. Therefore, a Finding of No Significant Impact is issued for the Proposed Action, and an Environmental Impact Statement does not need to be prepared.

APPROVED


WILLIAM T. CAHOON, Col, USAFR
Commander

DATE



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ABBREVIATIONS AND ACRONYMS

µg/L	micrograms per liter	FONPA	Finding of No Practicable Alternative
µg/m3	micrograms per cubic meter		
434 ARW	434 th Air Reserve Wing		
ACM	asbestos-containing material	FONSI	Finding of No Significant Impact
AFI	Air Force Instruction		
AFRC	Air Force Reserve Command	FPPA	Farmland Protection Policy Act
AQCR	air quality control region	ft2	square feet
AR	Army Regulation	FY	fiscal year
ARB	Air Reserve Base	FYDP	Five-Year Defense Plan
AST	aboveground storage tank	GHG	greenhouse gas
AT/FP	anti-terrorism/force protection	HAP	hazardous air pollutant
BASH	Bird/Wildlife Aircraft Strike Hazard	HAZMART	hazardous materials pharmacy
		HC/D 1.1	United Nations Organization Hazard Class/Division 1.1
bgs	below ground surface		
BMP	Best Management Practice	HQ	Headquarters
BRAC	Base Realignment and Closure	HRC	hydrogen releasing compound
Btu	British thermal unit	HUD	U.S. Department of Housing and Urban Development
CAA	Clean Air Act		
CEQ	Council on Environmental Quality	ICM	interim corrective measures
		ICRMP	Integrated Cultural Resources Management Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
CFR	Code of Federal Regulations		
CO	carbon monoxide		
CO2	carbon dioxide		
CWA	Clean Water Act	IDEM	Indiana Department of Environmental Management
dB	decibel		
dba	A-weighted decibels	IDNR	Indiana Department of Natural Resources
dbc	C-weighted decibels		
dbP	unweighted decibels	IRP	Installation Restoration Program
DNL	Day-Night Average A-weighted Sound Level	JP-4	Jet Propellant-4
DOD	Department of Defense	kV	kilovolt
DRMO	Defense Reutilization and Marketing Office	LBP	lead-based paint
		LEED	Leadership in Energy and Environmental Design
EA	Environmental Assessment		
EIS	Environmental Impact Statement	LID	low-impact development
		LTM	long-term monitoring
EISA	Energy Independence and Security Act	LUPZ	land use planning zone
		M&I	Maintenance and Inspection
EO	Executive Order	mg/m3	milligrams per cubic meter
IRP	Installation Restoration Program	MSW	municipal solid waste
		NAAQS	National Ambient Air Quality Standards
ESA	Endangered Species Act		
ETL	Engineering Technical Letter	NEPA	National Environmental Policy Act
FAA	Federal Aviation Administration		
FEMA	Federal Emergency Management Agency	NFRAP	No Further Response Action Planned
FIRM	Flood Insurance Rate Map	NO2	nitrogen dioxide

NOx	nitrogen oxide	U.S.C.	United States Code
NOA	Notice of Availability	USACE	U.S. Army Corps of Engineers
NPDES	National Pollutant Discharge Elimination System	USAF	U.S. Air Force
NRCS	National Resources Conservation Service	USEPA	U.S. Environmental Protection Agency
O3	ozone	USFWS	U.S. Fish and Wildlife Service
OG	Operations Group	UST	underground storage tank
OSHA	Occupational Safety and Health Administration	VOC	volatile organic compound
PK15(met)	peak sound pressure level		
Pb	lead		
PCB	polychlorinated biphenyl		
PM10	particulate matter equal to or less than 10 microns in diameter		
PM2.5	particulate matter equal to or less than 2.5 microns in diameter		
POL	petroleum, oil, and lubricant		
ppm	parts per million		
PSD	Prevention of Significant Deterioration		
PVC	polyvinyl chloride		
QD	quantity-distance		
RCRA	Resource Conservation and Recovery Act		
RI/FS	Remedial Investigation/Feasibility Study		
SAAQS	State Ambient Air Quality Standards		
SAP	satellite accumulation point		
SARA	Superfund Amendments and Reauthorization Act		
SHPO	State Historic Preservation Office		
SIP	State Implementation Plan		
SOx	sulfur oxide		
SPDES	State Pollutant Discharge Elimination System		
SSPP	Strategic Sustainability Performance Plan		
SWPPP	Storm Water Pollution Prevention Plan		
TCE	trichloroethylene		
TMDL	Total Maximum Daily Load		
TNT 2,4,6-	Trinitrotoluene		
TPH	total petroleum hydrocarbons		
tpy	tons per year		
TRPH	Total Recoverable Petroleum Hydrocarbons		

1 PURPOSE AND NEED FOR ACTION

1.1 BACKGROUND

Grissom AFB was established in 1942 as the Bunker Hill Naval Air Station and remained an active naval training site throughout World War II. Bunker Hill Naval Air Station was deactivated in 1946, and the land and facilities were leased to local business and agricultural interests. The site was reactivated in 1954 as Bunker Hill AFB and assigned to Tactical Air Command. During the next 40 years, the base underwent several additional transitions. The base came under the control of Air Mobility Command in 1992 with the disestablishment of the Strategic Air Command.

Pursuant to the Base Closure and Realignment Act of 1990, Grissom AFB was scheduled for realignment in October 1994. As a result of this realignment decision the HQ AFRC will retain approximately 1,312 acres as a cantonment, designated as the Grissom ARB, to conduct readiness training for the 434 ARW. Grissom ARB has one active runway and several aviation support facilities. Runway 5/23 is 12,500 feet in length and 200 feet wide (Air Force 1994). The runway has an Instrument Landing System for aircraft use during periods of inclement weather and aircraft arresting barriers for emergency stops.

1.2 PURPOSE AND NEED FOR ACTION

The purpose of the Proposed Action is to replace the current 1800 gallon per minute (gpm) Type II jet fuel hydrant system with a new 1800 gpm Type III jet fuel system. The need for the Proposed Action is the original Type II system was installed in 1957 and has reached the end of its design life. Even though the system has cathodic protection and has routinely been maintained, multiple leaks have occurred where the risers connect to the line. The existing system supports the current mission requirements, but its age and lack of environmental protection features threaten its ability to adequately support the mission in the future.

1.3 LOCATION OF PROPOSED ACTION

Grissom Air Reserve Base is situated in the north-central region of the U.S., the Peru area is located in the north-central portion of Indiana. The city is situated approximately 69 miles north of Indianapolis, Indiana. Located in Miami County, the City of Peru does not lie within a Metropolitan Statistical Area (MSA), but is listed as a Micropolitan Statistical Area (BOC, 2011). Miami County had a 2010 population of 36,903 (BOC, 2010b). Population for Peru City was 11,417 in 2010, which is the most current population figure available (BOC, 2010a).

1.4 SUMMARY OF KEY ENVIRONMENTAL COMPLIANCE REQUIREMENTS

1.4.1 NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] Section 4321–4347) is a Federal statute requiring the identification and analysis of potential environmental impacts associated with proposed Federal actions before those actions are taken. The intent of NEPA is to help decision makers make well-informed decisions based on an understanding of the potential environmental consequences and take actions to protect, restore, or enhance the environment. NEPA established the Council on Environmental Quality (CEQ) that was charged with the development of implementing regulations and ensuring Federal agency compliance with NEPA. The CEQ regulations mandate that all Federal agencies use a prescribed, structured approach to environmental impact analysis. This approach

also requires Federal agencies to use an interdisciplinary and systematic approach in their decision-making process. This process evaluates potential environmental consequences associated with a Proposed Action and considers alternative courses of action.

The process for implementing NEPA is codified in Title 40 of the Code of Federal Regulations (CFR), Parts 1500–1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*. The CEQ was established under NEPA to implement and oversee Federal policy in this process. The CEQ regulations specify that an EA be prepared to briefly provide evidence and analysis for determining whether to prepare a FONSI/Finding of No Practicable Alternative (FONPA), where a FONPA is appropriate, or whether the preparation of an EIS is necessary. The EA can aid in an agency's compliance with NEPA when an EIS is unnecessary and facilitate preparation of an EIS when one is required.

Air Force Policy Directive 32-70, *Environmental Quality*, states that the USAF will comply with applicable Federal, state and local environmental laws and regulations, including NEPA. The USAF's implementing regulation for NEPA is its *Environmental Impact Analysis Process* that is detailed in 32 CFR Part 989, as amended.

1.4.2 INTEGRATION OF OTHER ENVIRONMENTAL STATUTES AND REGULATIONS

To comply with NEPA, the planning and decision-making process for actions proposed by Federal agencies involves a study of other relevant environmental statutes and regulations. The NEPA process, however, does not replace procedural or substantive requirements of other environmental statutes and regulations. It addresses them collectively in the form of an EA or EIS, which enables the decision maker to have a comprehensive view of major environmental issues and requirements associated with the Proposed Action. According to CEQ regulations, the requirements of NEPA must be integrated “with other planning and environmental review procedures required by law or by agency so that all such procedures run concurrently rather than consecutively.”

1.4.3 SCOPE OF THE ANALYSIS

This EA examines potential effects of the Proposed Action and No Action Alternative on eight resource areas: noise, land use, air quality, water and soil resources, biological resources, socioeconomics and environmental justice, infrastructure, and hazardous materials and waste. These resource areas were identified as being potentially affected by the Proposed Action, and include applicable critical elements of the human environment whose review is mandated by Executive Order (EO), regulation, or policy.

Error! Reference source not found. contains examples of relevant laws, regulations, and other requirements that are often considered part of the analysis.

2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

This section describes the Proposed Action and the alternatives considered. As discussed in [Section 1.4.1](#), the NEPA process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action. Reasonable alternatives must satisfy the purpose of and need for a proposed action, which are defined in [Section 1.2](#). CEQ regulations specify the inclusion of a No Action Alternative against which potential effects can be compared. While the No Action Alternative would not satisfy the purpose of or need for the Proposed Action, it is analyzed in detail in accordance with CEQ regulations.

2.2 DETAILED DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action consists of the construction of a 1,800 gallon per minute (GPM) jet fuel (JP-8) hydrant system. The work includes the installation of up to 2,356 meters (8,000 feet) of eight inch coated carbon steel pipe to transfer the JP-8 from the bulk storage facilities to the hydrant tanks ([Figure 2](#)) and the installation of 1,160 meters (3,820 feet) of twelve inch coated carbon steel pipe composing the hydrant system ([Figure 2](#)). A new pumphouse will be constructed in the bulk storage yard to replace the existing pumphouse 404 ([Figure 3](#)). This pumphouse will include four offload stands and two fillstands and a fuel recovery system. The fuel recovery system will include a 4,000 gal underground tank, located north of the building ([Figure 5](#)). A new pumphouse will also be constructed on the airfield to replace the existing pumphouse 736 ([Figure 4](#)). This pumphouse will include two 475,000 liter (2,500 Barrel) storage tanks with concrete secondary containment, a fuel recovery system and a hydrant hose truck checkout stand. The fuel recovery system will include a 4,000 gal underground tank located to the west of the building ([Figure 6](#)).

Pumphouse 404 and existing truck fill and load fill stands will be demolished including associated piping equipment, slabs and foundation to four feet below grade. Abandoned piping left in place will be cleaned and grouted before abandonment ([Figure 7](#)). Pumphouse 736 will be demolished including associated piping equipment, slabs and foundation to four feet below grade including the removal of the six 267,000 liter (50,000 gal) underground storage tanks ([Figure 8](#)). The existing transfer pipeline from the bulk storage facility to the hydrant pumphouse will be drained, cleaned, demolished, and filled with grout before it is abandoned in place ([Figure 9](#)). The existing hydrant lateral piping will be drained, cleaned, demolished, and filled with grout before it is abandoned in place ([Figure 10](#)). All associated pits, valves, and structures will be demolished to four feet below grade and backfilled to grade.

2.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the Proposed Action would not be implemented and construction activities described herein would not be conducted. The current system, which is over 50 years old, would continue experience outages which will increase in frequency and duration. Failure to construct the new Type III Fuel Hydrant System would negatively impact the ability of the 434 ARW to carry out its mission.

2.4 ALTERNATIVES

As part of the NEPA process, reasonable alternatives to the Proposed Action must be considered. The development of reasonable alternatives involved discussions with Grissom ARB installation personnel to

evaluate the purpose of and need for the Proposed Action, alternative courses of action, designs, locations, and management practices for achieving the purpose and need. Consistent with the intent of NEPA, this screening process focused on identifying a range of reasonable project-specific alternatives and, from that, developing a proposed action that could be implemented in the foreseeable future. Based on technical, operational, and environmental selection standards, these alternatives were deemed infeasible and eliminated from further detailed analysis. Any alternatives considered for each project are discussed below.

2.4.1 ALTERNATIVE 1

Shut down existing system and remodel existing pumphouses and existing transfer pipeline. An alternative to constructing two new pumphouses was considered. Under this alternative the original pumphouses would have been remodeled instead of demolished. However this would require the complete shutdown of the existing system causing all loading and offloading of the planes to be conducted by hand with R-11 trucks. Grissom currently has three R-11 refuelers assigned for supporting refueling operations. Normal KC-135 generation requires an average of three R-11s per aircraft. Using the R-11s to refuel the aircraft adds an additional 45 to one hour increase over the use of the hydrant. This mode also requires an increase in manpower to conduct these operations. Instead of five personnel required to use the hydrant; seven are required to refuel using an R-11. This is not only time consuming it would cause long delays during this process. While remodeling the existing pumphouses the existing transfer pipeline would be removed and a new one installed.

This alternative was not deemed feasible because the existing hydrant system needs to remain active to meet mission requirements during the construction of the new system. While some money might be saved by remodeling the pumphouses verses building new ones; the additional costs associated this alternative would far outweigh the benefits. This alternative was not deemed feasible and will not be carried forward for detailed analysis in the EA. Therefore, other than the No Action Alternative, no alternative to the Proposed Action was identified.

2.4.2 PREFERRED ALTERNATIVE

Implementation of the Proposed Action, as described in [Section 2.2](#), is the Preferred Alternative

3 ENVIRONMENTAL CONSEQUENCES

The following discussion elaborates how environmental and socioeconomic resources impacts are categorized and described for the resource areas analyzed. Construction, demolition, and infrastructure activities would be accomplished in accordance with Federal and State regulations to minimize hazards associated with hazardous materials, wastes, and substances. Demolition activities pose an increased risk of construction-related accidents, but this level of risk would be managed in accordance with Federal and State regulations.

SHORT-TERM OR LONG-TERM.

These characteristics are determined on a case-by-case basis and do not refer to any rigid time period. In general, short-term effects are those that would occur only with respect to a particular activity or for a finite period or only during the time required for construction or installation activities. Long-term effects are those that are more likely to be persistent and chronic.

DIRECT OR INDIRECT.

A direct effect is caused by and occurs contemporaneously at or near the location of the action. An indirect effect is caused by a proposed action and might occur later in time or be farther removed in distance but still be a reasonably foreseeable outcome of the action. For example, a direct effect of erosion on a stream might include sediment-laden waters in the vicinity of the action, whereas an indirect impact of the same erosion might lead to lack of spawning and result in lowered reproduction rates of indigenous fish downstream.

NEGLIGIBLE, MINOR, MODERATE, OR MAJOR.

These relative terms are used to characterize the magnitude or intensity of an impact. Negligible effects are generally those that might be perceptible but are at the lower level of detection. A minor effect is slight, but detectable. A moderate effect is readily apparent. A major effect is one that is severely adverse or exceptionally beneficial.

ADVERSE OR BENEFICIAL.

An adverse effect is one having adverse, unfavorable, or undesirable outcomes on the man-made or natural environment. A beneficial effect is one having positive outcomes on the man-made or natural environment. A single act might result in adverse effects on one environmental resource and beneficial effects on another resource.

SIGNIFICANCE.

Significant effects are those that, in their context and due to their intensity (severity), meet the thresholds for significance set forth in CEQ regulations (40 CFR 1508.27).

CONTEXT.

The context of an effect can be localized or more widespread (e.g., regional).

INTENSITY.

The intensity of an effect is determined through consideration of several factors, including whether an alternative might have an adverse impact on the unique characteristics of an area (e.g., historical resources, ecologically critical areas), public health or safety, or endangered or threatened species or designated critical habitat. Effects are also considered in terms of their potential for violation of Federal, state, or local environmental law; their controversial nature; the degree of uncertainty or unknown effects, or unique or unknown risks; if there are precedent-setting effects; and their cumulative effects ([Section 4](#)).

3.1 NOISE

3.1.1 EVALUATION CRITERIA

Noise impact analyses typically evaluate potential changes to the existing noise environment that would result from implementation of a proposed action. Potential changes in the acoustical environment can be beneficial (i.e., if they reduce the number of sensitive receptors exposed to unacceptable noise levels or reduce the ambient sound level), negligible (i.e., if the total number of sensitive receptors to unacceptable noise levels is essentially unchanged), or adverse (i.e., if they result in increased sound exposure to unacceptable noise levels or ultimately increase the ambient sound level).

3.1.2 CURRENT NOISE ENVIRONMENT

The ambient sound environment throughout Grissom ARB is affected mainly by aircraft operations and automobile traffic. The runway at Grissom ARB is used by military aircraft and commercial aircraft. Military and commercial aircraft operations are the primary sound sources contributing to the ambient noise environment throughout the installation. Vehicles traveling east of the installation on U.S. 31, north of the installation on S.R. 218, south of the installation on west 850 south/Runway Road, and west of the installation on County Road West 500 South; and the roadways within the installation boundary also contribute to the ambient noise environment.

3.1.3 PROPOSED ACTION

CONSTRUCTION AND DEMOLITION NOISE.

The sources of noise under the Proposed Action that could impact populations include demolition and construction activities. These sources are addressed in the following paragraphs.

The components of the Proposed Action consist of constructing two new facilities and demolishing three old facilities. Please see [Section 2.2](#) for a description of the Proposed Action. Noise from demolition and construction activities varies depending on the type of equipment being used, the area that the action would occur in, and the distance from the noise source. To predict how construction activities would impact adjacent populations, noise from the probable construction and demolition activities was estimated. For example, as shown in [Table3–1](#), construction and demolition usually involves several pieces of equipment (e.g., trucks and bulldozers) that can be used simultaneously. Under the Proposed Action, the cumulative noise from the equipment, during the busiest day, was estimated to determine the total impact of noise from demolition and construction activities at a given distance. Examples of cumulative construction and demolition noise during daytime hours are shown in [Table3–1](#). These sound levels were estimated by adding the noise from several pieces of equipment and then calculating the decrease in noise levels at various distances from the source of the noise.

Table3–1. Estimated Noise Levels from Construction and Demolition Activities

Distance from Noise Source_	Estimated Noise Level_
50 feet	92 dBA
100 feet	86 dBA
150 feet	83 dBA
200 feet	80 dBA
400 feet	74 dBA
800 feet	68 dBA
1,200 feet	64 dBA

Construction and demolition of the proposed project could affect the ambient noise environment outside the installation boundary. Consequently, construction and demolition activities under the Proposed Action would result in short-term, minor, adverse impacts on the noise environment in the vicinity of construction and demolition activities. However, noise generation would last only for the duration of construction and demolition activities and would diminish as construction and demolition activities moved farther away from the receptor. Noise generation could be minimized by restricting construction and demolition to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.) and the use of measures such as equipment exhaust mufflers. It is not anticipated that the short-term increase in ambient noise levels from the Proposed Action would cause significant adverse effects on the surrounding populations.

VEHICULAR NOISE.

Short-term, negligible to minor, adverse impacts on the ambient environment are anticipated as a result of the increase in construction vehicular traffic under the Proposed Action. Construction traffic would use existing roadways to access Grissom ARB and would use the existing roadways within the installation boundary to access each project area.

OPERATIONAL NOISE.

Operation of the Proposed Action would involve installation personnel accessing the areas for their intended purpose and would not be expected to result in adverse impacts on the ambient noise environment. There would be no operational noise impacts on the ambient noise environment associated with the Proposed Action.

3.1.4 NO ACTION ALTERNATIVE

Under the No Action Alternative, the Proposed Action would not be implemented and conditions would remain the same. The Proposed Action would not be constructed and Grissom ARB would continue to use an outdated hydrant system without proper secondary containment and will continue to experience outages which adversely impact the ability to support the mission. No adverse effects on the ambient noise environment would occur under the No Action Alternative.

3.2 LAND USE

3.2.1 EVALUATION CRITERIA

An analysis of the effects of a proposed action on land use on an AFRC installation addresses the potential for impacts to occur on areas affected and the potential for buildings and other obstructions to intrude into controlled airspace. New construction should be compatible with current land use guidelines. Land use can remain compatible, become compatible, or become incompatible. Projected compatibility issues were measured both qualitatively and quantitatively. The level of potential land use effects is based on the degree of land use sensitivity in areas affected by a proposed action and compatibility of proposed actions with existing conditions. In general, a land use effect would be significant if it met any of the following criteria:

- Was inconsistent or in noncompliance with existing land use plans or policies
- Precluded the viability of existing land use
- Precluded continued use or occupation of an area
- Was incompatible with adjacent land use to the extent that public health or safety is threatened
- Conflicted with planning criteria established to ensure the safety and protection of human life and property.

3.2.2 CURRENT LAND USE

Most of the changes to the installation's development pattern involve the consolidation of pockets of similar land use types to form larger land use areas yielding greater future development potential.

The key to successfully developing Grissom ARB would be the identification and consolidation of compatible activities and the continued use of land use areas as opposed to individually sited facilities.

Grissom ARB is bordered by County Road South 500 West to the west, Thunderbolt Avenue to the north, US 31 to the east, and Runway Road, County Road West 850 South, to the south. The dominant feature on the southern side of the installation is the airfield, consisting of permanent aircraft parking aprons, apron access, taxiways and the runway. Immediately adjacent to the airfield is a consolidated area devoted to aircraft operations and maintenance. Within this area are key operational facilities, including the fuels systems maintenance hangar, aircraft maintenance hangar, and aircraft maintenance shop, which are all served by the hangar access apron.

See [Figure 11](#) for existing land use at Grissom ARB.

3.2.3 PROPOSED ACTION

Implementation of the Proposed Action would be expected to have short-term, negligible, adverse impacts on on-installation land use during construction and demolition activities. The Proposed Action would be in compliance with the 2007 *Grissom Air Reserve Base General Plan*. Implementation would not require changing the land use designation of the project sites. No change is anticipated in the future use of adjacent areas; therefore, the Proposed Action would not preclude the viability of existing adjacent land uses or future plans.

No impacts on off-installation land use would be expected from implementation of the Proposed Action.

3.2.4 NO ACTION ALTERNATIVE

Under the No Action Alternative, existing land use conditions would remain the same and no impacts would be expected.

3.3 AIR QUALITY

3.3.1 EVALUATION CRITERIA

The Federal *de minimis* threshold emissions rates were established by the USEPA in the General Conformity Rule to focus analysis requirements on those Federal actions with the potential to substantially affect air quality. [Table3–2](#) presents these thresholds by regulated pollutant. As shown in [Table3–2](#), *de minimis* thresholds vary depending on the severity of the nonattainment area classification.

The environmental consequences on local and regional air quality conditions near a proposed Federal action are determined based upon the increases in regulated pollutant emissions relative to existing conditions and ambient air quality. Specifically, the impact in NAAQS “nonattainment” areas is considered significant if the net changes in project-related pollutant emissions result in any of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Increase the frequency or severity of a violation of any ambient air quality standard
- Delay the attainment of any standard or other milestone contained in the SIP or permit limitations.

Table3–2. Conformity de minimis Emissions Thresholds

Pollutant	Grissom ARB Status	Classification	<i>de minimis</i> Limit (tpy)
O ₃ (measured as NO _x or VOCs)	Attainment	Extreme	10
		Severe	25
		Serious	50
		Moderate/marginal (inside ozone transport region)	50 (VOCs)/ 100 (NO _x)
		All others	100
	Attainment	Inside ozone transport region	50 (VOCs)/ 100 (NO _x)
		Outside ozone transport region	100
CO	Attainment	All	100
PM ₁₀	Attainment	Serious	70
		Moderate	100
		All maintenance areas	100
PM _{2.5} (measured directly, as SO ₂ , or as NO _x)	Attainment	All	100
SO ₂	Attainment	All	100
NO _x	Attainment	All	100
Pb	Attainment	All	25

Source: 40 CFR 93.153

With respect to the General Conformity Rule, effects on air quality would be considered significant if the proposed Federal action would result in an increase of a nonattainment or maintenance area's emissions inventory above the *de minimis* threshold levels established in 40 CFR 93.153(b) for individual nonattainment pollutants or for pollutants for which the area has been redesignated as a maintenance area. Since Grissom ARB is located in an area listed as in attainment for all criteria pollutants, a General Conformity assessment is not required for this Proposed Action.

3.3.2 CURRENT AIR QUALITY

The Proposed Action would occur in Miami County, which is part of the Wabash Valley Intrastate Air Quality Control Region (WVIAQCR) (40 CFR 81.218). The WVIAQCR is classified as Unclassifiable/Attainment for all criteria pollutants (USEPA 2011b). The most recent emissions inventories for Grissom ARB and Miami County are shown in [Table 3–3](#). Local and Regional Air Emissions Miami County is considered the local area of influence, and Grissom ARB is considered the immediate area of influence for the air quality analysis.

Table 3–3. Local and Regional Air Emissions

Air Quality Area of Influence	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO₂ (tpy)	PM₁₀ (tpy)	PM_{2.5} (tpy)
Grissom ARB	6.48	3.51	4.46	1.08	0.94	0.88
Miami County, Indiana	36.7	538	6.70	125	30.8	14.1

Source: USEPA 2002

Grissom ARB is classified as a false-minor source of air emissions and is permitted as a Federally Enforceable State Operating Permit (FESOP) by the state of Indiana. There are various stationary combustion sources on the installation that have the potential to emit criteria pollutants and HAPs, including the installation's boilers and generators. VOCs are emitted primarily from handling of organic liquids (i.e., refueling activities). Miscellaneous particulate matter sources at Grissom ARB include dust collectors, abrasive blasting units, and woodworking equipment. Other stationary sources at Grissom ARB include a paint booth, degreasers, solvent cleaners, aircraft fuel cell maintenance, aircraft engine test cell, and wash racks. There is no permitted stationary equipment on Grissom ARB. Mobile sources include aircraft operations, government-owned vehicles, privately owned vehicles, aerospace ground equipment, and other sources not included in the state's stationary source permitting program (GARB 2010b).

Grissom ARB is required to prepare and retain emissions inventories available if requested by the IDEM. The purpose of these emissions inventories is to estimate and document air pollutant emissions from stationary sources. Emissions inventories are retained at Base Civil Engineering in Building 641. [Table 3–4](#). Reported Stationary Source Air Emissions and summarizes the 2009 annual air emissions from stationary sources, potential to emit values, and major source thresholds.

Table 3–4. Reported Stationary Source Air Emissions and Potential to Emit Values Grissom ARB

Air Emissions	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO₂ (tpy)	PM₁₀ (tpy)	PM_{2.5} (tpy)	HAP (tpy)
Stationary Sources Actual Emissions	4.09	4.5	2.56	0.0286	0.62	0.46	1.15
Stationary Sources Potential to Emit Values	54	20.30	25.70	0.46	4.89	4.56	1.25
Major Source Threshold	100	100	100	100	100	N/A	25

Source: GARB 2010b

3.3.3 PROPOSED ACTION

The Proposed Action would generate both long- and short-term air pollutant emissions. The construction and demolition projects associated with the Proposed Action would generate air pollutant emissions as a result of grading, filling, compacting, trenching, and construction operations, but these emissions would be temporary and would not be expected to generate any offsite effects. The Proposed Action would not result in a net increase in personnel or commuter vehicles. Therefore, the Proposed Action's emissions from existing personnel and commuter vehicles would not result in an adverse impact on local or regional air quality.

Construction and demolition operations would result in short-term, minor, adverse impacts from emissions of criteria pollutants as combustion products from construction equipment, and evaporative emissions from architectural coatings and asphalt paving operations. Emissions of all criteria pollutants

would result from construction activities including combustion of fuels from on-road haul trucks transporting materials and construction commuter emissions.

Construction and demolition projects would generate particulate matter emissions as fugitive dust from ground-disturbing activities. Fugitive dust emissions would be greatest during initial site-preparation activities and would vary from day to day depending on the construction phase, level of activity, and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity. Appropriate fugitive dust-control measures would be employed during construction and demolition activities to suppress emissions.

STATIONARY SOURCE EMISSIONS.

All new stationary sources obtained as a result of the Proposed Action would be coordinated with the IDEM and would comply with all state and Federal laws and regulations, as appropriate and would be addressed through Federal and state permitting program requirements under New Source Review regulations (40 CFR Parts 51 and 52).

GREENHOUSE GAS EMISSIONS.

The Proposed Action would contribute directly to emissions of GHGs from the combustion of fossil fuels from construction activities and commuting of mission-support personnel. CO₂ accounts for 92 percent of all GHG emissions; electric utilities are the primary source of anthropogenic CO₂, followed by transportation. The U.S. Energy Information Administration estimates that in 2008, gross CO₂ emissions in the State of Indiana was 232 million metric tons of CO₂ (EIA 2011). Annual activities associated with the Proposed Action would emit 1,261 metric tons of CO₂. Total annual CO₂ emissions from the Proposed Action would be 0.00054 percent of the Indiana state CO₂ emissions. Therefore, the Proposed Action would represent a negligible contribution towards statewide GHG inventories.

Summary.

Grissom ARB is located in Miami and Cass Counties, which are classified as in attainment for all criteria pollutants. The General Conformity Rule requirements are not applicable to the Proposed Action.

3.3.4 NO ACTION ALTERNATIVE

Under the No Action Alternative, Grissom ARB would not implement the Proposed Action, which would result in the continuation of the existing condition. Therefore, no direct or indirect adverse impacts would be expected on local or regional air quality from implementation of the No Action Alternative.

3.4 CULTURAL RESOURCES

3.4.1 EVALUATION CRITERIA

Cultural resources include archaeological resources, historic architectural or engineering resources, and other traditional resources. Section 106 and 110 of the National Historic Preservation Act protect cultural resources that are listed or eligible for listing in the National Register. As required by the DOD, Grissom ARB has an Integrated Cultural Resources Management Plan (ICRMP) that outlines compliance with the applicable laws and other legal requirements.

3.4.2 CURRENT CULTURAL RESOURCES INVENTORY

Grissom ARB currently has no listed or eligible for listing facilities. An installation wide Archaeological Reconnaissance Survey was conducted in 1992 followed by a Phase I Archaeological Survey in 1993. Seven sites were encountered or revisited during this investigation. Site, 12Mi559, the Graves Site, was recommended for further evaluation. A Phase II review, consisting of an archival research and limited test excavations, was conducted in 1993. The results indicated the site was not eligible for inclusion on the National Register of Historic Places (NRHP)

Grissom ARB's standard operating procedures for unanticipated discoveries provided in the CRMP would be followed should any unanticipated cultural resources, including archaeological sites, be encountered during construction activities (GARB 2011a).

3.5 WATER AND SOIL RESOURCES

3.5.1 EVALUATION CRITERIA

Evaluation criteria for effects on water resources are based on water availability, quality, and use; existence of floodplains; and associated regulations. A proposed action would have significant effects on water resources if it were to do one or more of the following:

- Substantially reduce water availability or supply to existing users
- Overdraft groundwater basins
- Exceed safe annual yield of water supply sources
- Substantially adversely affect water quality
- Endanger public health by creating or worsening health hazard conditions
- Threaten or damage unique hydrologic characteristics
- Violate established laws or regulations adopted to protect water resources.

The potential effect of flood hazards on a proposed action is important if such an action occurs in an area with a high probability of flooding.

Minimization of soil erosion is considered when evaluating potential effects of a proposed action on soil resources. Generally, adverse effects can be avoided or minimized if proper construction techniques, erosion-control measures, and structural engineering design are incorporated into project development. Effects on soils would be significant if they would alter the soil composition, structure, or function within the environment.

3.5.2 CURRENT WATER AND SOIL RESOURCES

3.5.2.1 WATER RESOURCES

HYDROLOGY. The topography in the vicinity of Grissom ARB is flat to gently rolling with elevations ranging from about 780 feet above sea level near the northern boundary of the Base, to about 810 feet above sea level near the southeastern boundary of the Base. The installation is in the Upper Wabash River Basin, in the Pipe Creek drainage area (GARB 2000).

GROUNDWATER. The water table is unconfined and is seasonally at or above ground level in many locations. The principle aquifer in the region is the Liston Creek Limestone. A well developed secondary porosity has evolved along joints and bedding planes. Migration rates in the limestone aquifer range from moderate to rapid, depending locally on dissolution cavities. Overlying the Liston Creek Limestone are glacial deposits with a moderate permeability, which could offer a secondary water supply. Recharge to the overlying glacial deposits is by rainfall. Migration rates in the glacial deposits range from slow in clay layers to rapid in sand/gravel units. The general flow of the ground water follows the surface topography and flows in a north and northeast direction, ultimately discharging in Pipe Creek [Dept. of the Air Force, 1994 (a)]. Three potable water wells are present at Grissom ARB, plus five wells operated by the local water utility and multiple private wells are located in the vicinity of the base. Groundwater monitoring wells are present throughout the installation in support of the USAF's Installation Restoration Program (IRP) (GARB 2011b). These monitoring wells are sampled quarterly or annually for VOCs or BTEX, depending on site conditions. This is discussed further in [Section Error!](#)
Reference source not found..

SURFACE WATER. The major surface water features at Grissom ARB are man-made ditches. There are multiple ditches located throughout the base, the majority of them used to drain the airfield. The largest of these ditches is called McDowell or Government Ditch. McDowell Ditch originates on Grissom ARB and has several ditches and culverts flowing into it. McDowell Ditch flows through the western side of the Base (Outfall 001). McDowell Ditch continues north to Pipe Creek which flows into the Wabash River.

Six outfalls discharge storm water collected from the base to various ditches which all flow into Pipe Creek, a tributary of the Wabash River. These outfalls are visually inspected on a quarterly basis by Grissom ARB. IDEM issued a general National Pollution Discharge Elimination System (NPDES) Permit for storm water discharges associated with industrial activity on 21 Jun 2009, which expires on 21 Jun 2014 (Permit Number INR000001).

The General Permit requires an annual report and sampling at four outfalls. Analytical results from the current grab samples and a comparison of these sample results to the other results from within the permit years are included in each report. The grab samples are collected from outfalls 001, 002, 003, and 005. They are sampled for: oil & grease, carbonaceous biochemical oxygen demand (CBOD₅), chemical oxygen demand (COD), total suspended solids (TSS), total kjeldahl nitrogen (TKN), total phosphorus, pH, Nitrate plus nitrite nitrogen. Rule 6 requires that “any pollutant that has the potential to be present in the storm water discharge” also be sampled. Potassium acetate and propylene glycol have been identified as potential pollutants and added to the list (GARB 2011b).

WETLANDS. Wetlands on the installation were identified following the procedures defined in the 1987 *USACE Wetlands Delineation Manual* (USACE 1987). Delineation of jurisdictional wetlands was based on the occurrence of the following three parameters: hydrophytic vegetation, hydric soils, and wetland hydrology. A base wide wetland delineation was conducted in 1998, which identified six Jurisdictional wetlands on the installation. Two of these wetlands were filled in and mitigated for in 2003.

No wetlands have been mapped within or adjacent to the Proposed Action.

WATERS OF THE UNITED STATES.

No waters of the United States have been identified on Grissom ARB.

FLOODPLAINS.

There are no floodplains located on Grissom ARB ([APPENDIX B](#))

3.5.2.2 SOIL RESOURCES

The U.S. Department of Agriculture’s Natural Resources Conservation Service (NRCS) mapped and classified the installation’s soils in 1979. Grissom ARB occupies level to gently sloping land areas dominated by two soils mapping units. Primary soil series within these mapping units are the Fincastle silt loam and the Treaty silt loam. In general, these soils consist of deep, nearly level, poorly drained, medium-textured soils formed on upland glacial till plains. The Fincastle soils, located on the higher grounds of the Base, have a high water capacity, moderately slow permeability, slow surface runoff, and a water table at 1 to 3 feet in winter and spring. Slopes range from 0 to 2 percent. Treaty soils, located in small shallow depressions and narrow drainageways, have a high water capacity, moderate permeability, very slow surface runoff, and a water table between the surface and a depth of 1 foot during a significant portion of the year. Frost heaving, a high water table, and moderate permeability restrict downward movement of roots and water within the Treaty soils. Both of these soils have a slight erosion potential. In addition, both the Fincastle and Treaty soils are considered hydric containing 9 percent and 85 to 100 percent hydric soils, respectively.

Much of the Base has been developed since these soil classifications were prepared in 1979 by the USDA SCS. Approximately one-third to half of the area is overlain by pavement and other impermeable

structures. Many of the native soil profiles have been disturbed and no longer exist. The developed lands were graded and filled and are now classified as Udorthents-Urban. It is difficult to define the characteristics of these man-made lands, but the National Cooperative Soil Survey has identified several possible limitations affecting the development of these soils. These limitations include a potentially high seasonal water table shallowness to bedrock, show permeability, and excessive shale and stone coarse fragment content.

The Base is located in Seismic Zone 1, which represents a low potential risk for large seismic events. No major faults or fracture zones have been mapped on or within the vicinity of Grissom ARB. The last seismic event in the region registering greater than 5.0 on the Richter scale occurred in 1987.

3.5.3 PROPOSED ACTION

3.5.3.1 WATER RESOURCES

Implementation of the Proposed Action has the potential to result in long-term, minor, indirect, adverse effects on water resources as storm water runoff volume and velocity would be expected to increase due to the increase in impervious surfaces. This increased runoff could impact the surface water quality of the receiving water bodies, such as Little Deer Creek & the Wabash River. However, the Grissom ARB *Erosion and Sedimentation Pollution Control Plan* and *Storm Water Pollution Prevention Plan* would implement BMPs to prevent surface water degradation. Grissom ARB would adhere to provisions in the general permit including maintenance of water quality. Adherence to standard engineering practices and applicable codes and ordinances would typically reduce storm water runoff-related impacts to a level of insignificance. Both vegetative and structural measures will be used.

Excavation or trenching will be required to install utilities and piping for the Proposed Action. These activities would be expected to have a short-term, minor, and long-term, negligible impact on the drawdown of the water table in the vicinity of the site.

In the Proposed Action an unregulated drainage ditch is proposed to be relocated and partially covered with the installation of a culvert. The ditch is proposed to be relocated to retain drainage functionality within the site and covered to eliminate potential safety concerns. Relocation and culvert installation in the ditch would result in short-term, minor adverse impacts on storm water runoff during relocation activities, and long-term, negligible impacts after relocation.

Construction activities are permitted on an individual basis, once the activity disturbs over an acre of soil and contributes storm water discharge to surface waters of the State or into a municipal storm sewer system. Under Indiana Administrative Code 327 the operator of the site must obtain a NPDES permit and implement controls to minimize erosion and sedimentation at the site.

WETLANDS.

No construction would occur within or adjacent to delineated wetlands; therefore, no direct or indirect effects on wetlands would be anticipated to occur.

WATERS OF THE UNITED STATES.

No projects would be constructed within or adjacent to waters of the United States, and therefore no effects would be anticipated from implementing the Proposed Action.

3.5.3.2 Soil Resources

Under the Proposed Action, short-term, minor to moderate, and long-term, minor, adverse effects on soils would be anticipated from soil disturbance and increased sedimentation and erosion. A majority of the areas proposed for soil disturbance are currently and will continue to be covered by concrete or asphalt; however, effects would be reduced to a level of insignificance from adhering to IDEM regulations to maintain pre-development site hydrology.

Site-specific soil surveys would be necessary to ascertain if engineering limitations exist. Under the Proposed Action, construction activities such as grading, excavating, trenching, and recontouring of the soil would result in soil disturbance.

Implementation of BMPs during construction would limit potential impacts resulting from construction activities. Measures for reducing erosion and sedimentation associated with construction of the Proposed Action would be addressed in site-specific SWPPPs. Fugitive dust associated with construction activities would be minimized by watering and soil stockpiling, thereby reducing the total amount of soil exposed to negligible levels. Standard erosion controls (e.g., silt fencing, sediment traps, application of water sprays, and revegetation at disturbed areas) would also reduce potential impacts associated with soil erosion and sedimentation.

3.5.4 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no change from existing conditions at the installation. No impacts on water or soil resources would be anticipated.

3.6 BIOLOGICAL RESOURCES

3.6.1 EVALUATION CRITERIA

The significance of effects on biological resources is based on (1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource, (2) the proportion of the resource that would be affected relative to its occurrence in the region, (3) the sensitivity of the resource to proposed activities, and (4) the duration of ecological effects. A habitat perspective is used to provide a framework for analysis of general classes of effects (e.g., noise, human disturbance).

Ground disturbance and noise associated with construction activities directly or indirectly cause potential impacts on biological resources. Direct impacts from ground disturbance were evaluated by identifying the types and locations of potential ground-disturbing activities in correlation to important biological resources. Habitat removal and damage or degradation of habitats could be effects associated with ground-disturbing activities.

Noise associated with a proposed action might be of sufficient magnitude to result in the direct loss of individuals and reduce reproductive output within certain ecological settings. Ultimately, extreme cases of such stresses could have the potential to lead to population declines or local or regional extinction. To evaluate effects, considerations were given to number of individuals or critical species involved, amount of habitat affected, relationship of the area of potential effect to total critical habitat within the region, type of stressors involved, and magnitude of the effects. Since no federally listed endangered, threatened, proposed, or candidate species are known to inhabit Grissom ARB, and there is no designated critical habitat on the installation, no environmental analysis was conducted pursuant to Section 7 of the ESA.

3.6.2 CURRENT BIOLOGICAL RESOURCES

VEGETATION

Grissom ARB lies within the Central Till Plain Natural Region and the Beech-Maple Forest Section of the Eastern Deciduous Forest Province.

Most of the Base is urbanized and the original vegetation has been removed or significantly altered by development, construction, landscaping, and other disturbances. Consequently, there is very little opportunity for historic native plant communities to occur on Grissom ARB. The area most likely to harbor isolated occurrences of native vegetation is the unimproved grounds in the western portion of

the cantonment area which have been relatively unmaintained and may harbor some remnant native vegetation. However, this area supports chiefly successional communities and does not contain unique native vegetative species. There have been no observations made of any historically significant or unique native vegetative species occurring on Grissom ARB (GARB 2010a).

WILDLIFE

Currently, Grissom ARB holds a USFWS and IDNR Category II habitat classification. Even though Grissom ARB is relatively small in size, the Base has a diversity of habitat and land use features that provide limited opportunity for wildlife to inhabit the Base. However, fencing and other land use features, and the amount of industrial and agricultural activities immediately surrounding the Base further limit this opportunity.

The fisheries habitat on Grissom ARB consists of the unnamed tributaries that feed into McDowell Ditch, Bennett-Campbell Ditch, and Cline Ditch. Intermittent flow and poor water quality attribute to the low value of these waterways in relation to their ability to support aquatic species.

PROTECTED AND SENSITIVE SPECIES

Grissom's Natural Resource Manager conducts multiple yearly surveys for federally and state listed threatened, endangered, and species of special concern. No federally or state listed threatened, endangered or species of special concern are known to occur on the Base. However several transient species may utilize the Base for roosting and/or foraging. [APPENDIX C](#) has a listing of threatened, endangered, and special concern species for Miami and Cass Counties.

CRITICAL HABITAT

There is no FSWS designated critical habitat on Grissom ARB.

3.6.3 PROPOSED ACTION

VEGETATION.

Construction within the project sites for the Proposed Action would be expected to have long-term, direct, negligible adverse impacts on vegetation. Sites for the new pumphouses are within open space composed primarily of nonnative grasses and various broadleaved weeds that are mowed regularly. The areas where the transfer pipe and hydrant pipe are to be installed are on disturbed portions of Grissom ARB, currently covered by either asphalt or concrete. Impacts on vegetation are expected to be negligible from the permanent loss of existing vegetation within any of the project sites. Long-term, direct, negligible to minor, beneficial impacts would be expected if areas that are disturbed from construction activities are replanted with native vegetation.

WILDLIFE

Implementation of the projects associated with the Proposed Action would have short-term, negligible to minor, indirect, adverse impacts on wildlife due to effects of construction noise and heavy equipment use. Most wildlife species in the construction vicinity would be expected to quickly recover once the construction noise and disturbances have ceased. Additionally, Grissom ARB is heavily developed in the proposed construction areas and aircraft operations are frequent, so wildlife currently inhabiting the project sites should be habituated to noise disturbances.

The new pumphouse areas in Proposed Action would have long-term, direct, negligible to minor adverse impacts on wildlife due to the permanent loss of habitat. On the other hand, the current pumphouses will be demolished increasing habitat for wildlife. Some species could have potential to occur within or use the sites; however, most of these sites are regularly mowed and provide only marginal habitat for most wildlife species. Any impacts are considered minimal due to the additional of habitat.

PROTECTED AND SENSITIVE SPECIES.

No federally listed threatened or endangered species have been documented on Grissom ARB during previous surveys conducted yearly by the Grissom ARB Natural Resource Manager; therefore, no adverse effects on federally listed species would be expected from the Proposed Action.

Implementation of the Proposed Action would have short-term, negligible to minor, indirect, adverse impacts on migratory birds due to disturbances from construction noise and heavy equipment use. Most migratory birds in the construction vicinity would be expected to quickly recover once the construction noise and disturbances have ceased. Additionally, Grissom ARB is heavily developed in the construction areas and aircraft operations are frequent; therefore, the migratory birds currently inhabiting the project sites should be habituated to noise disturbances.

CRITICAL HABITAT

There is no USFWS-designated critical habitat within any of the project sites. Therefore, no impacts on critical habitat would be expected.

3.6.4 NO ACTION ALTERNATIVE

Under the No Action Alternative, existing conditions would remain as is and implementation of the project associated with the Proposed Action would not occur. If the No Action Alternative were carried forward, there would be no associated change in or effects on biological resources at Grissom ARB.

3.7 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

3.7.1 EVALUATION CRITERIA

SOCIOECONOMICS.

This section addresses the potential for direct and indirect impacts that projects associated with the Proposed Action could have on local or regional socioeconomics. Impacts on local or regional socioeconomics are evaluated according to their potential to stimulate the economy through the purchase of goods or services and increases in employment and population. Similarly, impacts are evaluated to determine if overstimulation of the economy (e.g., the construction industry's ability to sufficiently meet the demands of a project) could occur as a result of the Proposed Action.

ENVIRONMENTAL JUSTICE.

Ethnicity, poverty status, and youth population data were examined at the city, county, and state level to determine if low-income, minority, or youth populations could be disproportionately affected by the Proposed Action.

3.8 CURRENT SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE RESOURCES

Grissom ARB is located on the west side of U.S. Highway 31 within a rural area of Miami and Cass Counties, approximately 6 miles south of Peru and 18 miles north of Kokomo. Small farming communities within the area include Bunker Hill, Walton, Galveston, and Onward (GARB 1995). The area economy is driven by two sectors: manufacturing and agriculture. Manufacturing firms are primarily situated within the Kokomo area. Agricultural activities occur throughout the region, with most of the land within the Grissom ARB environs being used for grain production, primarily corn (GARB 1995).

Table 3–5 presents demographic characteristics in terms of total population, growth, and population density for the City of Peru and Miami County. Grissom ARB and the surrounding area are not located within a MSA, but Peru, IN is a Micropolitan Statistical Area (BOC 2009). In Miami County, population has remained relatively unchanged from 2000 to 2009. The 2009 population for the City of Peru was 12,217, which represents a decrease of 5.97 percent over the 2000 population of 12,994.

Table 3–5.2000-2009 Demographic Characteristics for the Area

COUNTY AND CITY	POPULATION		PERCENT CHANGE	2000 POPULATION DENSITY
	2000	2009	2000-2009	(Persons per Sq. Mi.)
Miami County	36,082	36,001	-0.2	96
Peru City	12,994	12,217	-6.0	2815.5

Source: BOC 2009

Housing characteristics for the area include total housing units and vacancy rates. From 2000 to 2009, the total number of housing units for Miami County increased slightly from 15,299 to 15,871. In 2000, the total number of housing units for the City of Peru was 5,943. From 2000 to 2008 median household income and per capita income for Miami County increased. Per capita income for Miami County increased from \$17,726 to \$26,584 (City 2009).

Grissom ARB is the largest employer in Miami County.

3.8.1 PROPOSED ACTION

SOCIOECONOMICS.

No significant effects on socioeconomics would be expected from implementation of the Proposed Action. Short-term, minor, direct and indirect, beneficial impacts would be expected as a result of construction expenditures. Miami County and the surrounding counties contain enough construction workers, which collectively should be able to meet the demand of the Proposed Action. The use of local construction workers would produce increases in local sales volumes, payroll taxes, and the purchases of goods and services. The Proposed Action would not lead to major increases or decreases in the number of persons employed or stationed at Grissom ARB; therefore, no significant effects on demographics would be expected.

ENVIRONMENTAL JUSTICE.

Activities associated with the Proposed Action would occur within Grissom ARB boundaries. Therefore, disproportionate impacts on minority or low-income populations would not be expected.

3.8.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, the Proposed Action would not occur. No impacts on socioeconomics would be expected as no jobs would be created from the Proposed Action, expenditures for goods and services to maintain the existing facilities would be minimal, and there would be no increase in tax revenue as a result of employee wages or sales receipts. Also, impacts on environmental justice would not occur as part of the No Action Alternative as Grissom ARB would continue operating under current conditions.

3.9 INFRASTRUCTURE

3.9.1 EVALUATION CRITERIA

Effects on infrastructure are evaluated based on their potential for disruption or improvement of existing levels of service and additional needs for energy and water consumption, sanitary sewer and wastewater systems, and transportation patterns and circulation. Impacts might arise from physical changes to circulation, construction activities, introduction of construction-related traffic on local roads or changes in daily or peak-hour traffic volumes, and energy needs created by either direct or indirect workforce and population changes related to installation activities. An effect might be considered

adverse if a proposed action exceeded capacity of a utility. A proposed action could have a significant effect with respect to infrastructure if the following were to occur:

- Exceeded capacity of a utility
- A long-term interruption of the utility
- A violation of a permit condition
- A violation of an approved plan for that utility.

3.9.2 CURRENT INFRASTRUCTURE

WATER SUPPLY.

Drinking water is supplied to Grissom ARB from Peru Utilities which operates the former Grissom Air Force Base Water Treatment Plant. Groundwater is pumped from several ground water wells located outside the military cantonment area. These wells range in depth from 150 to 180 feet and have a total pumping capacity of 400 to 1,050 gallons per minute or a total combined pumping capacity of 2.2 million gallons per day (mgd). The ground water is softened, chlorinated, fluoridated, and treated for iron at the water treatment plant. Excess supplies of treated water are stored in three elevated storage tanks, with a total capacity of 1.6 million gallons (GARB 2007).

There are three active potable water wells on Grissom ARB. These wells serve only isolated buildings on the airfield, which are unable to be connected to the potable water system. The installation does not provide any additional treatment to the potable water supply prior to consumption. This system meets all USEPA potable water standards. There are no reported problems of potable water quality.

Distribution of water occurs via water mains and service laterals in a looped system ranging in pipe size and pipe material. Water main pipes range in size from 6-, 8-, and 10-inches and are composed primarily of steel and PVC. Lateral lines are 6- to 8 inches and consist of predominantly galvanized iron copper and HDPE pipe. The water supply system on Grissom ARB was constructed approximately 50 years ago and has been updated multiple times since then. Service laterals range in age from 2 to 50 years old, and are in the process of being replaced (GARB 2007).

The potable water system is also used for fire protection and suppression. Fire suppression capability is supplemented by a 173,000-gallon underground reservoir and two electric pumps, with a spot for a third in Building 476. This reservoir supports fire suppression for six aircraft maintenance hangars used by the 434 ARW. Fire hydrants are provided at regular intervals on the potable water distribution system (GARB 2007).

Drinking water is sampled periodically by bioenvironmental engineering personnel at various locations, including the temporary quarter, the clinic, and other facilities. The water is monitored for chlorine, pH, fluoride, bacteria, lead, and copper. Deficient water lines are replaced as necessary, and system expansion occurs concurrent with new construction.

SANITARY SYSTEMS.

Grissom ARB's wastewater is disposed of through Peru Utilities sanitary sewer lines and sewage treatment facility. Grissom ARB's wastewater is transported off-installation via one 12-inch force main. All wastewater is delivered to the Peru Utilities wastewater treatment plant, where it is treated and discharged into Pipe Creek. Grissom ARB does use septic systems for the treatment and disposal of wastewater, in isolated areas. Industrial wastes are treated through oil/water separators and grease traps, which subsequently discharge directly to the sanitary sewer system for additional treatment.

The collection system on Grissom ARB consists of gravity flow pipes and force mains of various construction materials, including vitrified clay and polyvinyl chloride (PVC). The system is approximately

fifty years old with multiple updates over that time. The age of lines varies depending on the area of the installation. The system consists predominately of gravity flow mains. There are eight lift stations aligned along the collection system on the installation.

The Peru Utilities' sanitary sewer collection system and sewage treatment plant are adequate to meet the wastewater treatment requirements of Grissom ARB.

NATURAL GAS.

NIPSCO is the natural gas provider for Grissom ARB. NIPSCO purveys natural gas to the installation via one 6-inch 2406 HDPE gas main. Grissom maintains ownership and maintenance of the distribution system. This system consists of laterals ranging in size from 1- to 3-inches in diameter, composed of 2406 HDPE pipe. The system currently operates at a standard 50 psi. Grissom ARB assumes maintenance responsibility for the entire system. There is no storage facility for natural gas on the installation (GARB 2007).

Natural gas is the primary heating source for facilities on Grissom ARB. The highest consumption rates are recorded during the winter months. NIPSCO provides uninterrupted service to the installation, and historically there have been no capacity or supply hindrances (GARB 2007).

The gas supply system is sufficient for current needs and requirements.

ELECTRICITY.

Miami-Cass County and Rural Electric Membership Cooperation (REMC) provide electricity for Grissom ARB. Miami-Cass REMC owns all non airfield primary power systems while Grissom owns all secondary and airfield power systems. Each owner is responsible for maintenance on their system. The electrical system was upgraded in 2007 with the installation of new switching gear, conductors and transformers. Mission-critical facilities are equipped with emergency generators in the event of unplanned commercial power outages.

Miami-Cass County REMC supplies electrical power to Grissom ARB through a double-end 69-kilovolt (kV) overhead transmission line. All electrical lines on base are buried underground to minimize outages due to weather.

COMMUNICATION SYSTEMS.

The 434 ARW Communications Flight operates and maintains communications systems and equipment at Grissom ARB to meet mission requirements. The communications system consists of fiber optic cable between buildings and twisted pair copper cable for in-building connectivity, mixed with wireless networks. All buildings on Grissom ARB are connected to the network or have access to it.

TRANSPORTATION NETWORK.

Vehicular access to Grissom ARB is provided at two points. The Main Gate, supporting the highest traffic volume, is at the corner of Foreman Drive and Hoosier Boulevard. One alternate access point is provided at the western end of Hoosier Boulevard. Access to the installation is provided by U.S 31 or State Road 218. Hoosier Boulevard experiences the highest traffic volumes. Once inside the installation, primary roads provide circulation.

SOLID WASTE.

Wabash Valley Refuse Removal handles collection, transportation, and disposal of refuse at Grissom ARB. The installation's refuse is collected in 30 separate dumpsters, ranging in size from 2-cubic yard to 6-cubic-yard dumpsters. Cardboard, paper, scrap metal, glass, plastic, are collected and sold by the installation. Construction and demolition waste and nonrecurring municipal solid waste (MSW) generated under contract are the responsibility of the contractor. This debris is usually collected in

larger roll-off containers. Construction and demolition waste and nonrecurring MSW generated under contract or by installation personnel are recycled to the greatest extent possible. The refuse and construction debris is disposed of in a nearby off-installation permitted landfill. Contractors are required to report the quantities of recycled construction and demolition waste (GARB 2002).

3.9.3 PROPOSED ACTION

WATER SUPPLY.

Short-term, negligible, direct, adverse effects might occur during various phases of construction associated with the Proposed Action due to water shut-offs at various locations throughout the installation, but effects would be negligible in comparison to the long-term, beneficial effects. Implementation of the Proposed Action could have adverse effects from increased water use, but these increases would be minor in comparison with total installation water usage. Water supply lines from Peru Utilities have adequate capacity and supply to accommodate water demands associated with the Proposed Action. Construction associated with the Proposed Action would use energy conservation fixtures and, therefore, long-term, negligible, indirect, beneficial effects on water supply would be expected as a result of the Proposed Action.

SANITARY SYSTEMS.

Implementation of the Proposed Action would result in long-term, negligible, indirect, adverse effects from increases in sanitary sewer use, but these increases are likely to be minor when compared to installation wide water usage. Construction associated with the Proposed Action would use energy conservation fixtures and therefore, long-term, negligible, indirect, beneficial effects on sanitary systems would be expected as a result of the Proposed Action.

NATURAL GAS SYSTEMS.

The main natural gas supply line enters the installation near the Main Gate, so no new major supply lines would be necessary. Minor increases in demand for natural gas would likely occur, but these increases would be minor when compared to total installation wide demand. No adverse impacts on natural gas systems would result from the Proposed Action.

ELECTRICAL SYSTEMS.

The Proposed Action would result in an increase in the electric usage on Grissom ARB. The electrical power system purchased through Peru Utilities and distributed through government and utility-owned lines, would be able to accommodate the Proposed Action. The main power supply line enters the installation near the Main Gate, so no new transmission supply lines would be necessary. Construction associated with the Proposed Action would use energy-conservation fixtures and therefore, long-term, negligible, indirect, beneficial effects on electrical systems would be expected as a result of the Proposed Action.

COMMUNICATION SYSTEMS.

The Proposed Action would not result in a change in communication systems. No adverse effects on communication systems would result from the Proposed Action.

TRANSPORTATION NETWORK.

Potential impacts on transportation and circulation are evaluated for disruption or improvement of current transportation patterns and systems, deterioration or improvement of traffic volume, and changes in existing levels of transportation safety. Impacts could arise from physical changes to circulation (e.g., closing, rerouting, or creating roads), construction activity, introduction of construction-related traffic on local roads, or changes in daily or peak-hour traffic volumes increased by either direct or indirect work force and population changes related to facility activities. Impacts on roadway capacities would be significant if roads were forced to operate at or above their full design capacity.

Short-term, minor, adverse, direct and indirect impacts on transportation systems would be anticipated during construction activities.

SOLID WASTE.

In considering the basis for evaluating the significance of impacts on solid waste, several items are considered. These items include evaluating the degree to which the proposed construction projects could affect the existing solid waste management program and capacity of the area landfill. Solid waste generated from the proposed construction activities would consist of building materials such as solid pieces of concrete, and any materials not recyclable thought the base or by the contractor. Metals (conduit, piping, and wiring), lumber, paper & cardboard are recycled through the Base (or by the contractor through an outside source). It is assumed part of the demolition waste generated will be recycled at the Air Force goal, 50%, and will not be placed in a landfill. It is also assumed part of all of the milled asphalt and concrete will be reused as base material. Impacts at the local landfills will be minimal and will not greatly shorten the life span of the landfill. [Section 3.10](#) discusses hazardous materials and wastes associated with the Proposed Action.

3.9.4 NO ACTION ALTERNATIVE

Under the No Action Alternative, Grissom ARB would not implement the Proposed Action, which would result in the continuation of existing conditions. No direct changes in environmental effects would be expected on infrastructure.

3.10 HAZARDOUS MATERIALS AND WASTE

3.10.1 EVALUATION CRITERIA

Impacts on hazardous materials and waste would be considered significant if the action resulted in noncompliance with applicable Federal, state, and USAF regulations, or increased the amounts of hazardous substances generated or procured beyond current Grissom ARB waste management procedures and capacities. Impacts on the IRP would be considered significant if the action disturbed or created contaminated sites, resulting in adverse effects on human health or the environment.

3.10.2 CURRENT HAZARDOUS MATERIAL AND WASTE

HAZARDOUS AND PETROLEUM WASTES.

Grissom ARB is considered a large-quantity generator of hazardous

LEAD-BASED PAINT.

A LBP survey was accomplished in February 2011. Building 736 had no positive sample results and Building 404 had one positive sample result, which was located on a cinder block wall.

ASBESTOS-CONTAINING MATERIALS.

Grissom ARB maintains an Asbestos Management Plan that was last updated in June 2010. Two major surveys have been conducted at Grissom ARB. In January 1994, AmTech Engineering completed and base wide asbestos survey and in January 1988 Hall-Kimbrell Environmental Services conducted another base wide survey. Sampling for ACM occurred in April 2011. Building 404's original asphalt roofing material tested positive. Building 736's original asphalt roofing material was inaccessible and is therefore presumed to contain ACM.

POLYCHLORINATED BIPHENYLS.

The buildings proposed for demolition could contain light ballasts containing PCBs.

INSTALLATION RESTORATION PROGRAM.

To date, a total of 52 IRP sites have been identified at Grissom ARB (GARB 2009). Previous remediation actions and environmental clean-up and subsequent monitoring results at all but two of GARB's sites

have shown that no residual contamination remains that poses unacceptable risk to environmental or human receptors. These former IRP sites have been closed with the concurrence of the state. Two active IRP sites remain: A former oil/water separator site associated with removed building 741 (site OW-741), and a JP-4 pipeline low point drain box associated with fuel loss to soil (ST-08).

Figure 12 presents the location of the active sites. There are no active IRP sites in the project areas, but two former IRP sites are located in the work areas. PL-757 is located in the POL yard to the southeast of the current pumphouse and SS-56 is located at the current pumphouse 736 site.

Both active sites (OW-741 & ST-08) and all the closed sites, except PL-757 & SS-56, will not be affected by the proposed action would not be affected by the Proposed Action, they will not be discussed further in detail in this EA. Former IRP Site PL-757 and SS-56 have No Further Remedial Action Planned (NFRAP) status and even though they are associated with the project sites, do not pose a significant concern in those areas. Since they are closed and not expected to any significant concerns, they will not be discussed further in this EA.

Nine groundwater monitoring wells (MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, and MW-9), are located near the POL project area. These wells are not considered active, but are required to be kept for future sampling (GARB 2009).

3.10.3 PROPOSED ACTION

HAZARDOUS MATERIALS AND PETROLEUM PRODUCTS.

Short-term, minor, adverse impacts would be expected. Construction and demolition activities would require the use of certain hazardous materials such as paints, welding gases, solvents, preservatives, and sealants. Construction equipment used during the Proposed Action would contain fuel, lubricating oils, hydraulic fluid, and coolants that could be regulated as hazardous materials if they spilled or leaked at any of the project sites. Prior to mobilization, all construction vehicles and equipment would be inspected to ensure a leak-free operation. Appropriate spill containment material would be kept on site. All fuels and other hazardous materials would be contained in the construction equipment or stored in appropriate containers and would be removed upon completion of the Proposed Action. It is anticipated that the quantity of products containing hazardous materials used during the Proposed Action would be minimal and their use would be of short duration. Contractors would be responsible for the management of hazardous materials, which would be handled in accordance with Federal, state, and local regulations and the Hazardous Materials Emergency Planning and Response Plan. Therefore, no long-term, direct or indirect, adverse impacts would be expected.

HAZARDOUS AND PETROLEUM WASTES.

Short-term, minor, and long-term, negligible to minor, adverse impacts would be expected. It is anticipated that the quantity of hazardous wastes generated from proposed construction and demolition activities would be minor and would not be expected to exceed the capacities of existing hazardous waste disposal facilities. Hazardous wastes would be handled under the existing DOD RCRA-compliant waste management programs and, therefore, would not be expected to increase the risks of exposure to workers and installation personnel. Prior to commencement of construction activities, the contractor would be required to obtain the necessary construction permits. It is anticipated that operation and maintenance activities associated with the Proposed Action would result in a slight increase in hazardous waste generation at the installation. However, the long-term increase in hazardous waste would be minor and would not be expected to exceed the capacities of existing hazardous waste disposal facilities. The 434 ARW would be responsible for the disposal of hazardous wastes in accordance with Federal, state, and local regulations and the Hazardous Waste Management Plan.

LEAD-BASED PAINT.

Any further sampling will be handled in accordance with applicable State, Federal, and Air Force regulations. Demolition will be handled in accordance with applicable State, Federal, and Air Force regulations and disposed of at an approved solid waste facility. As long as demolition of this material does not intentionally remove the paint from the strata it is not considered a hazardous waste and can be disposed of with the other construction and demolition debris. This would result in a minimal less than significant impact.

No impacts would be expected during operation of the buildings proposed for construction under the Proposed Action.

ASBESTOS-CONTAINING MATERIALS.

Any further sampling will be handled in accordance with applicable State, Federal, and Air Force regulations. Demolition will be handled in accordance with applicable State and Federal regulations and disposed of at an approved solid waste facility. Asphalt roofing material is classified as a non-friable Category 1, during the demolition this material should remain non-friable. Therefore, by rule it can be disposed of with the other construction and demolition debris. This would result in a minimal less than significant impact.

No impacts would be expected during operation of the buildings proposed for construction under the Proposed Action. USAF regulations restrict the use of ACM for new construction. AFI 32-1023 requires that a substitution study be conducted whenever the use of an ACM in construction, maintenance, or repair is considered. If it is determined that the ACM is superior in cost and performance characteristics, and has minimal actual or potential health hazards, then the ACM can be used. In all other cases non-ACM should be used.

POLYCHLORINATED BIPHENYLS.

The buildings proposed for demolition could contain light ballasts containing PCBs. The light fixtures within the buildings would be removed prior to demolition and would be handled in accordance with Federal and state regulations and the installation's Hazardous Waste Management Plan. Sampling, removal, and disposal of any light ballast would be short-term in duration and would result in less than significant impacts. In addition, the proposed demolition projects could include the removal of pad-mounted transformers. Those identified as containing PCBs would be handled in accordance with Federal and state regulations and the installation's Hazardous Waste Management Plan. Sampling, removal, and disposal of any PCBs would be short-term in duration and would result in less than significant impacts.

INSTALLATION RESTORATION PROGRAM.

Short-term, negligible to minor and adverse impacts could be expected from implementation of the Proposed Action. The Proposed Project sites would be in the vicinity of a former IRP sites (PL-757 & SS-56). Groundwater contamination at these sites could be encountered during construction and demolition activities. Should contamination be encountered, the handling, storage, transportation, and disposal activities would be conducted in accordance with applicable Federal, state, and local regulations; AFIs; and Grissom ARB's management procedures. A health and safety plan would be prepared in accordance with OSHA requirements prior to commencement of construction activities.

There is also the potential to encounter contaminated soil. Project planning should include the potential need for sampling and subsequent remediation within the project area to account for the potential inadvertent discovery of contaminated soil. If it was determined that sampling was required, all soil sampling would be conducted prior to commencement of construction and demolition activities. If results of the sampling were to indicate the presence of contamination, remediation efforts would take place prior to commencement of construction and demolition activities. The handling, storage, transportation, and disposal of hazardous substances would be conducted in accordance with applicable

Federal, state, and local regulations; USAF regulations; and Grissom ARB's management procedures. IRP infrastructure (e.g., monitoring wells) is present near the project site; therefore, project planning would include protection of IRP infrastructure to avoid disruption of clean-up activities and minimize potential impacts on IRP infrastructure. The nine groundwater monitoring wells associated with former IRP Site PL-757 that are near the Proposed Project site would be protected from damage to ensure their integrity for future sampling.

3.10.4 NO ACTION ALTERNATIVE

Under the No Action Alternative, the Proposed Action would not be implemented. There would be no soil disturbance and no risk of encountering hazardous substances. No construction would occur as planned under the Proposed Action. In general, there would be no change in or impacts on environmental restoration, or hazardous materials and wastes at Grissom ARB if the Proposed Action was not implemented.

4 CUMULATIVE AND ADVERSE IMPACTS

CEQ regulations stipulate that the cumulative effects analysis in an EA should consider the potential environmental effects resulting from “the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions” (40 CFR Part 1508.7). CEQ guidance in considering cumulative effects affirms this requirement, stating that the first steps in assessing cumulative effects involve defining the scope of the other actions and their interrelationship with a proposed action. The scope must consider other projects that coincide with the location and timetable of a proposed action and other actions. Cumulative effects analyses must also evaluate the nature of interactions among these actions (CEQ 1997).

4.1 RESOURCE SPECIFIC CUMULATIVE EFFECTS

The scope of the cumulative effects analysis involves both timeframe and geographic extent in which effects could be expected to occur, and a description of what resources could potentially be cumulatively affected. For the purposes of this analysis, the temporal span of the Proposed Action is 4 years, which would encompass the construction period and beginning of operations. For most resources, the spatial area for consideration of cumulative effects is Grissom ARB, though a larger area is considered for some resources.

OTHER DEVELOPMENT IN GRISSOM ARB AREA

Grissom is a rural area with ongoing development activity. The environmental effects of the projects analyzed in this EA would have little potential to interact with or result in cumulative effects with any other projects off the installation. Therefore, potential cumulative effects associated with other development activities in the Grissom area were not considered in detail in this EA.

4.1.1 Resource Specific Cumulative Effects

No significant adverse cumulative effects were identified in the cumulative effects analysis.

AIR QUALITY.

The Proposed Action would have a negligible contribution to cumulative effects on air quality. The combination of all aspects of the project could produce short-term, minor, adverse effects during construction activities. Construction-related emissions would last only during those activities and would not cumulatively be significant.

NOISE.

The Proposed Action would have a short term minor adverse effect on the noise environment during the construction and demolition activities. The ambient sound environment would continue to be dominated primarily by military and civilian aircraft and vehicle traffic. Cumulative effects would not be significant.

LAND USE.

The Proposed Action would not require or stimulate industrial, commercial, or residential development to support it. The Proposed Action does not have the potential to affect the overall trend or pattern of development around Grissom ARB. No significant development projects were identified in the vicinity of Grissom ARB. No cumulative impacts related to land use, overall zoning, and land management objectives were identified.

WATER AND SOIL RESOURCES

The Proposed Action would have a negligible contribution to adverse cumulative effects on water and soil resources, assuming the use of BMPs to control sedimentation and erosion. Since there are no floodplains located on Grissom ARB, there will be no negative effect on floodplains.

BIOLOGICAL RESOURCES.

The Proposed Action would result in vegetation removal. Cumulatively, this would be a negligible to minor adverse effect considering the relatively small amount of vegetation that would be removed in comparison with how much is available in nearby areas. The demolition of the proposed buildings would also result in additional vegetation which would help to minimize the total amount of vegetation loss.

INFRASTRUCTURE.

No cumulative effects on infrastructure have been identified. Utilities and infrastructure systems are expected to be able to accommodate new facilities.

SOCIOLOGY AND ENVIRONMENTAL JUSTICE.

No cumulative effects on socioeconomics have been identified. The Proposed Action could produce short-term, minor, beneficial effects as a result of construction expenditures. Construction-related expenditures would last only during those activities and would not cumulatively be significant.

HAZARDOUS MATERIALS AND WASTES.

No cumulative effects on hazardous materials and wastes have been identified. The Proposed Action could produce short-term, minor, adverse effects during construction activities, but these would not be significant. Existing hazardous material and waste management plans would accommodate short- and long-term, minor increases in usage.

4.2 UNAVOIDABLE ADVERSE EFFECTS

Unavoidable adverse impacts would result from implementation of the Proposed Action. None of these impacts would be significant.

GEOLOGICAL RESOURCES.

Under the Proposed Action, construction activities, such as grading, excavating, and trenching of the ground, would result in some minor soil disturbance. Implementation of BMPs during construction would limit environmental consequences resulting from construction activities. Standard erosion-control means would also reduce environmental consequences related to these characteristics. Although unavoidable, impacts on soils at the installation are not considered significant.

INFRASTRUCTURE.

Solid waste would be generated as a result of construction and demolition activities. This is an unavoidable but minor adverse impact that can be mitigated to a certain extent by possible recycling opportunities.

HAZARDOUS WASTES AND MATERIALS.

Products containing hazardous materials would be procured and used during the proposed facilities construction projects. It is anticipated that the quantity of products containing hazardous materials used during the construction activities would be minimal and their use would be of short duration. Contractors would be responsible for the management of hazardous materials, which would be handled in accordance with Federal and state regulations. Contractors must report use of hazardous materials. It is anticipated that the quantity of hazardous wastes generated from proposed construction activities would be negligible. Contractors would be responsible for the disposal of hazardous wastes in accordance with Federal and state laws and regulations, and the Hazardous Waste Management Plan.

The potential for construction accidents or spills during fuel handling are unavoidable risks associated with the Proposed Action.

ENERGY RESOURCES.

The Proposed Action would require the use of fossil fuels, a nonrenewable natural resource. The use of nonrenewable resources in construction activities, and subsequently with the operations of facilities and additional aircraft and helicopters, would be unavoidable. Relatively small amounts of energy resources would be committed to the Proposed Action and are not considered significant.

4.3 COMPATIBILITY OF THE PROPOSED ACTION AND ALTERNATIVES WITH THE OBJECTIVES OF FEDERAL, REGIONAL, STATE AND LOCAL LAND USE PLAN, POLICIES AND CONTROLS

Environmental effects of the Proposed Action would occur entirely within the boundaries of Grissom ARB. The proposed project has been sited according to existing land use zones. Consequently, construction activities would not be in conflict with installation land use policies or objectives. The Proposed Action would not conflict with any applicable off-installation land use ordinances or designated clear zones.

4.4 RELATIONSHIP BETWEEN THE SHORT-TERM USE OF ENVIRONMENT AND LONG-TERM PRODUCTIVITY

Short-term uses of the biophysical components of the human environment include direct impacts, usually related to construction activities that occur over a period of less than 5 years. Long-term uses of the human environment include those impacts that occur over a period of more than 5 years, including permanent resource loss.

This EA identifies potential short-term, adverse effects on the natural environment as a result of construction activities. These potential adverse effects include noise emissions, air emissions, soil erosion, storm water runoff into surface water, and increased traffic. Proposed construction activities would be expected to increase the long-term productivity of Grissom ARB by removing old and outdated facilities and replacing them with modern and efficient facilities.

4.5 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

An irreversible or irretrievable commitment of resources refers to impacts on or losses to resources that cannot be reversed or recovered, even after an activity has ended and facilities have been decommissioned. A commitment of resources is related to use or destruction of nonrenewable resources, and effects that such a loss will have on future generations. For example, if prime farmland is developed there would be a permanent loss of agricultural productivity. The Proposed Action involves the irreversible and irretrievable commitment of material resources and energy, land resources, landfill space, and human resources. The impacts on these resources would be permanent.

MATERIAL RESOURCES.

Material resources irretrievably used for the Proposed Action include steel, concrete, and other building materials. Such materials are not in short supply and would not be expected to limit other unrelated construction activities. The irretrievable use of material resources would not be considered significant.

ENERGY RESOURCES.

Energy resources used for the Proposed Action would be irretrievably lost. These include petroleum-based products (e.g., gasoline and diesel) and electricity. During construction, gasoline and diesel fuel

would be used for the operation of construction vehicles. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no significant impacts would be expected.

LANDFILL SPACE.

The generation of construction and demolition debris and subsequent disposal of that debris in a landfill would be an irretrievable adverse impact. Construction contractors would be expected to recycle at least 50 percent of the debris generated; the solid waste diversion rate would increase by 2 percent every year until it reaches 50 percent in 2015-2020. Construction and demolition debris diversion rates are 52 percent in 2011, increasing by 2 percent every year until reaching 60 percent in 2015-2020. If a greater percentage is recycled, then irretrievable impacts on landfills would be reduced. There are numerous rubble landfills and construction and demolition processing facilities that could handle the waste generated. However, any waste that is generated by the Proposed Action that is disposed of in a landfill would be considered an irretrievable loss of that landfill space.

HUMAN RESOURCES.

The use of human resources for construction is considered an irretrievable loss only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action represents employment opportunities, and is considered beneficial.

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Figures

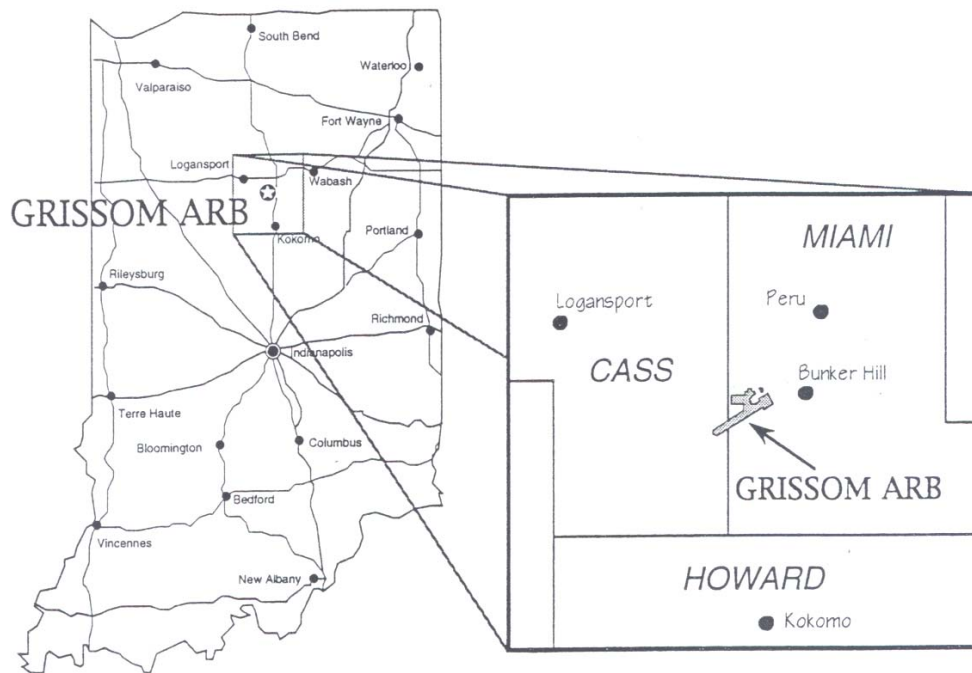


Figure 1 GRISSOM ARB VICINITY MAP

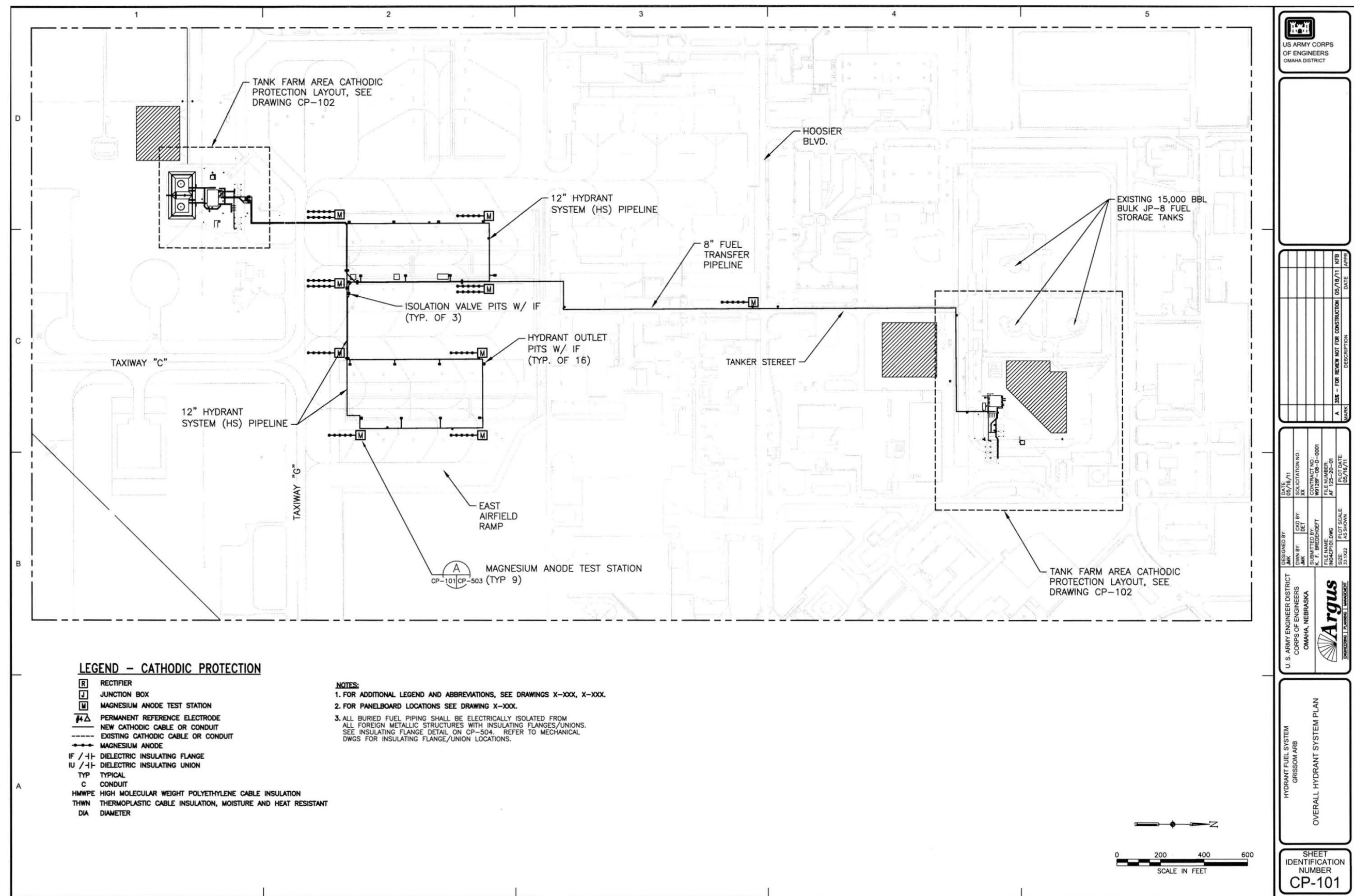


Figure 2 Overall Hydrant System Plan

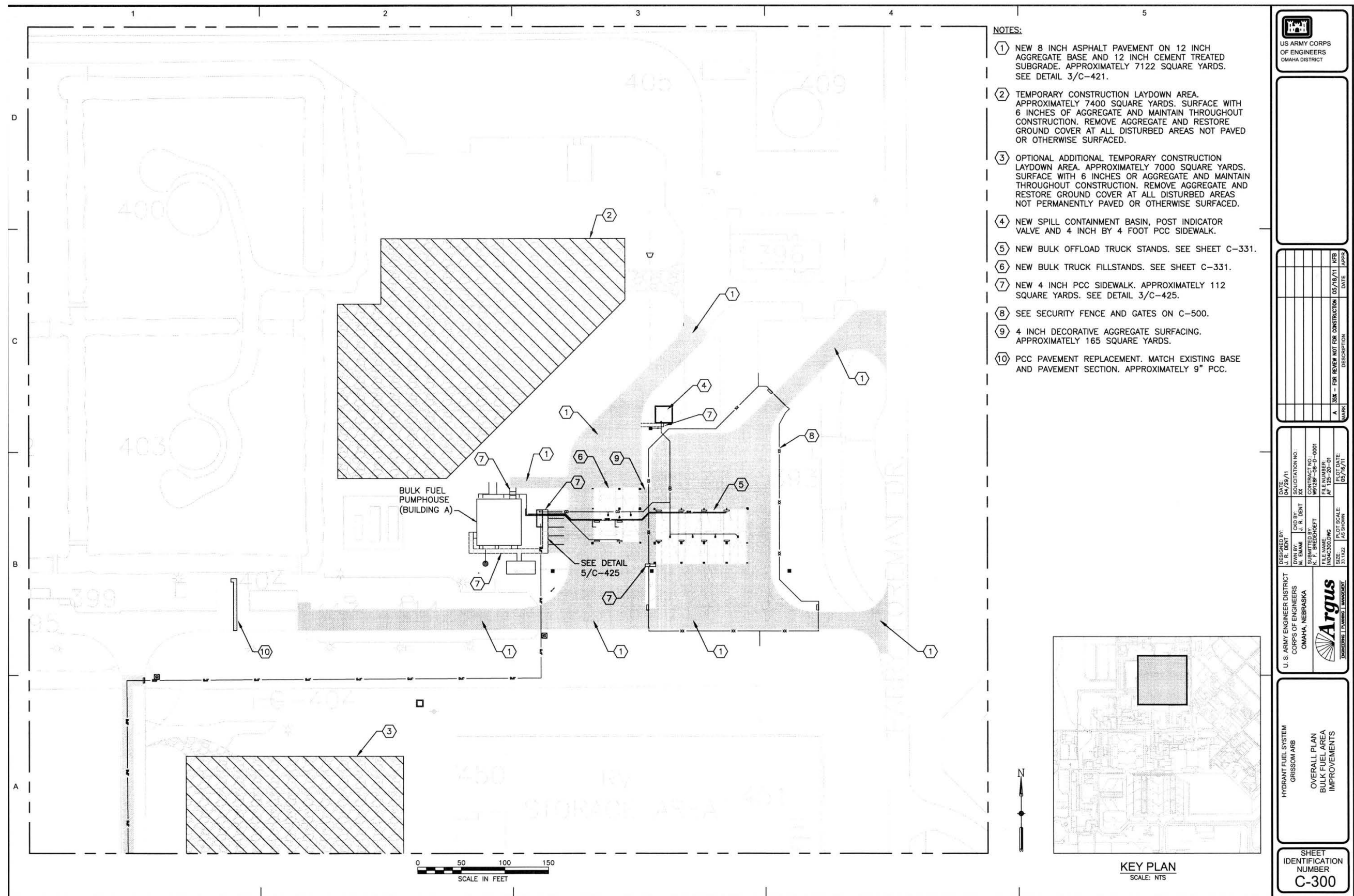


Figure 3 Overall Plan Bulk Fuel Area

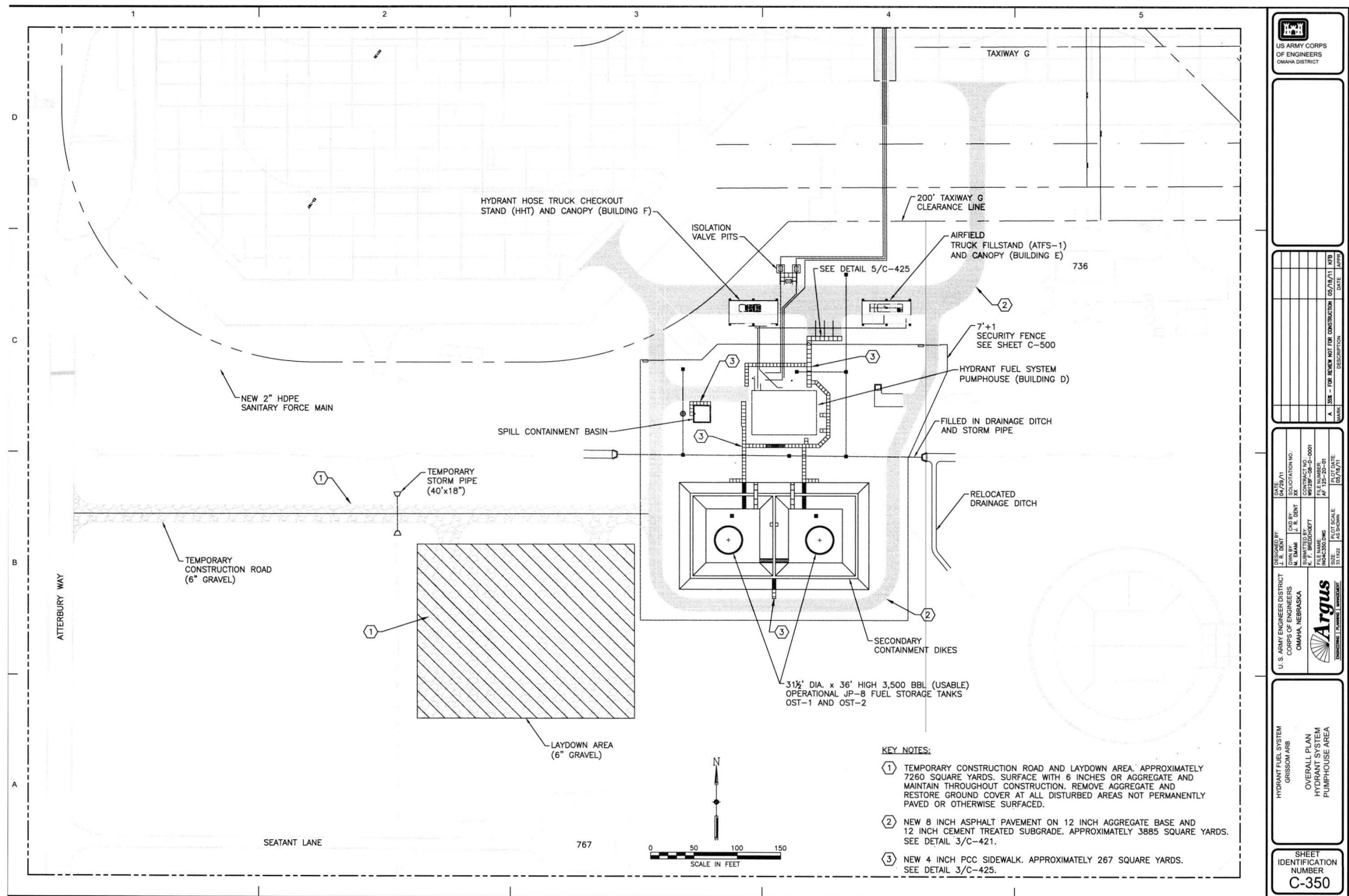


Figure 4 Overall Plan Hydrant Area

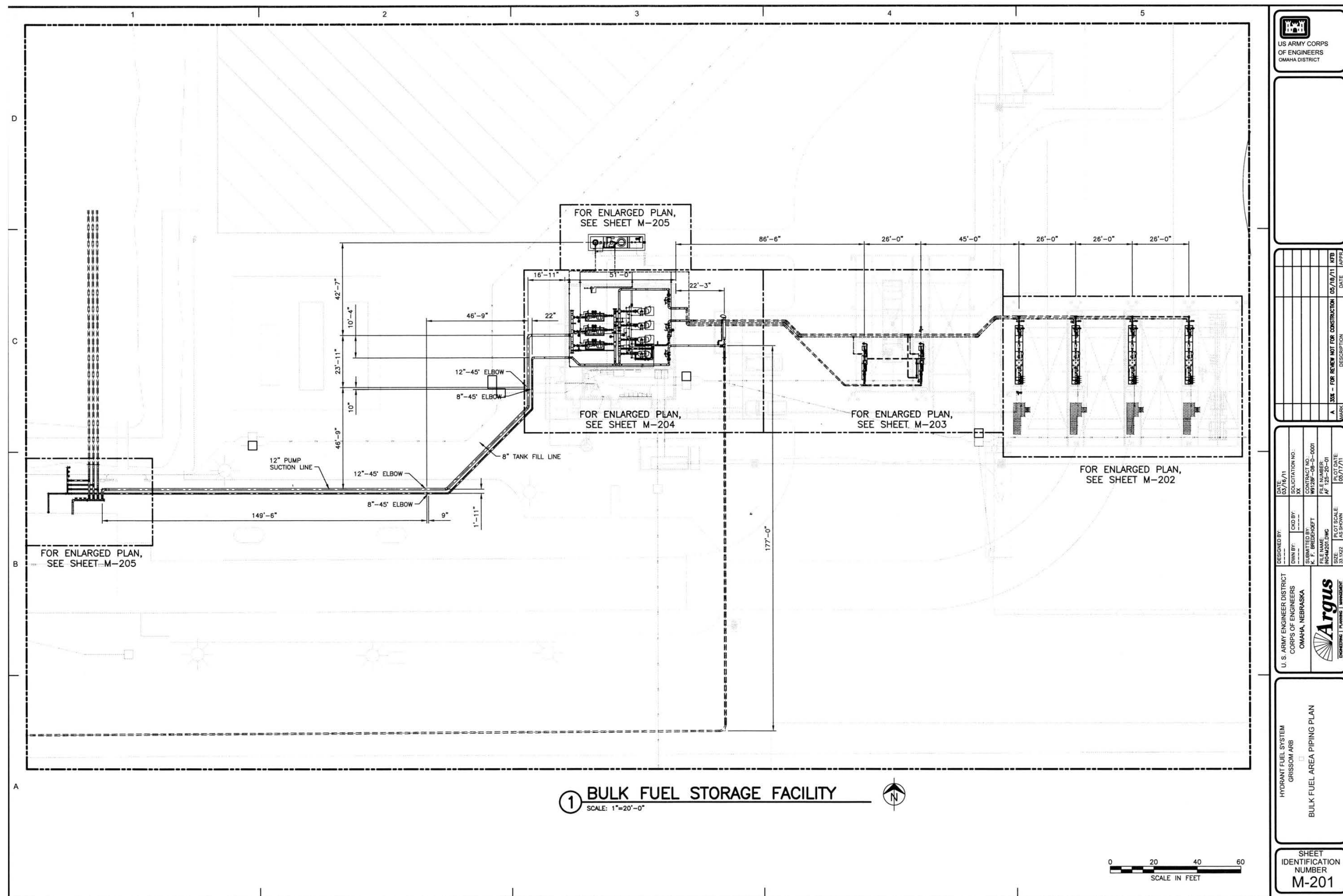


Figure 5 Bulk Fuel Pumphouse Area Piping Plan

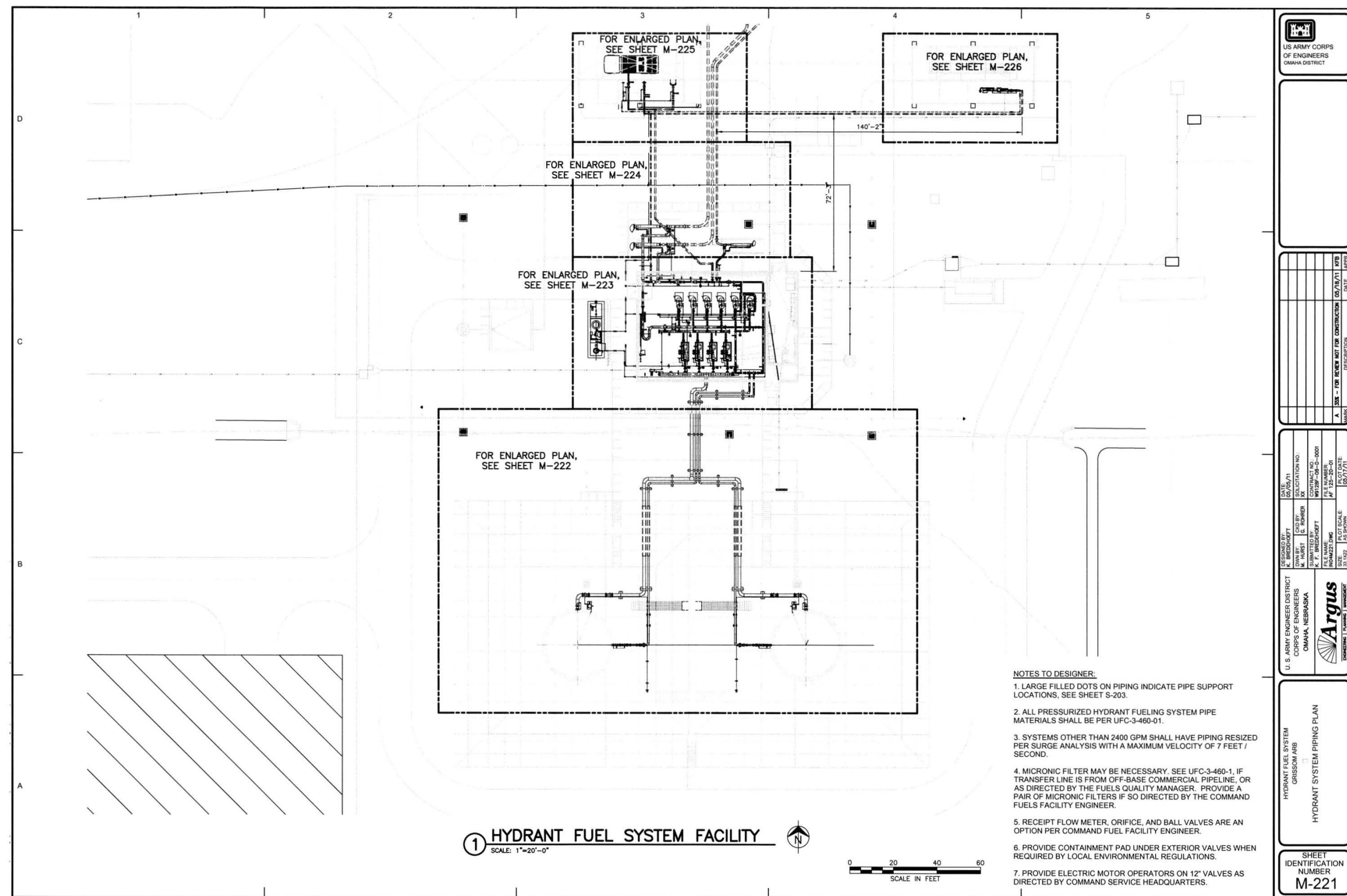


Figure 6 Hydrant Pumpouse Piping Plan

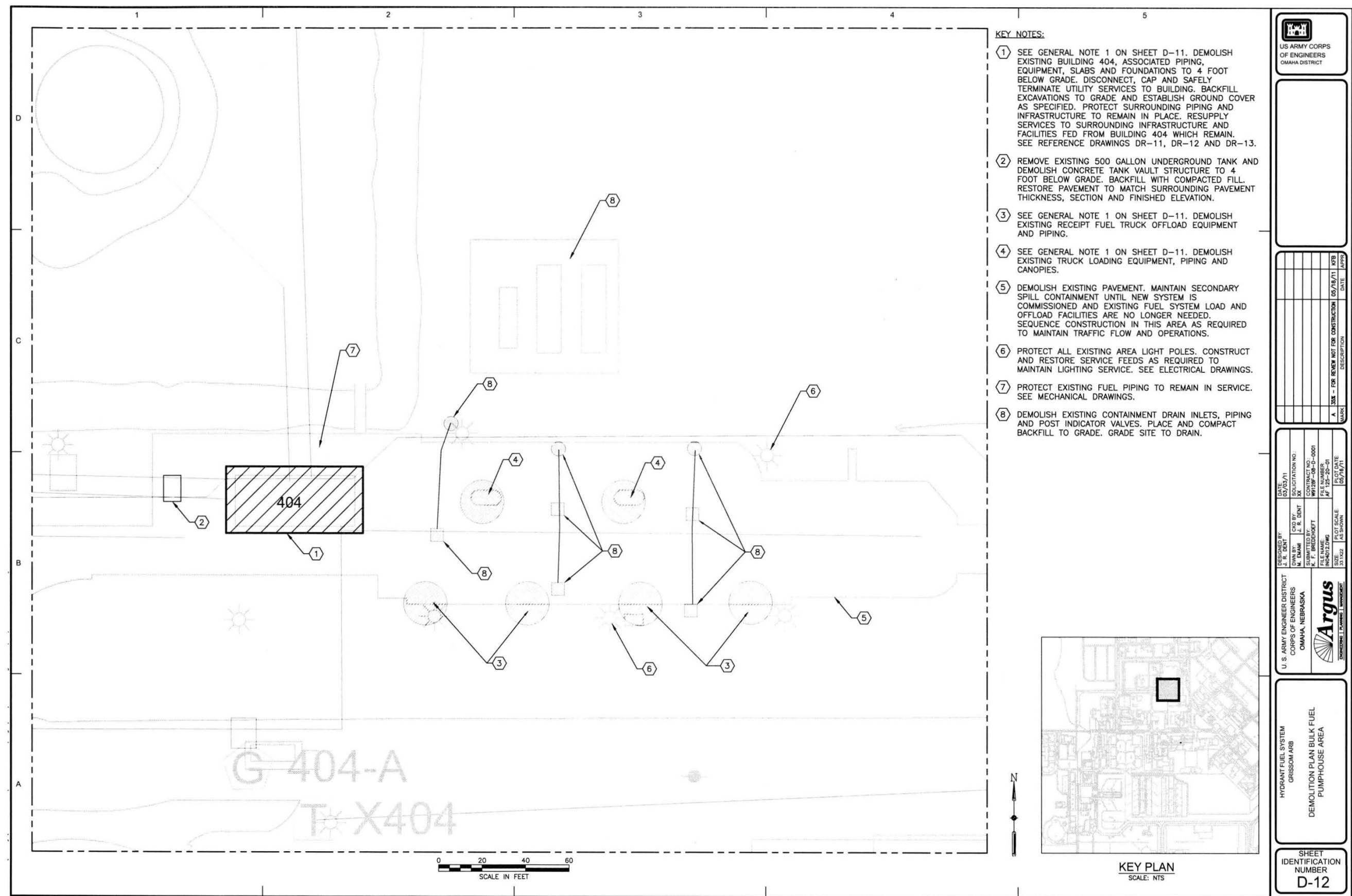


Figure 7 Bulk Fuel Area, Pumphouse 404, Demolition Plan

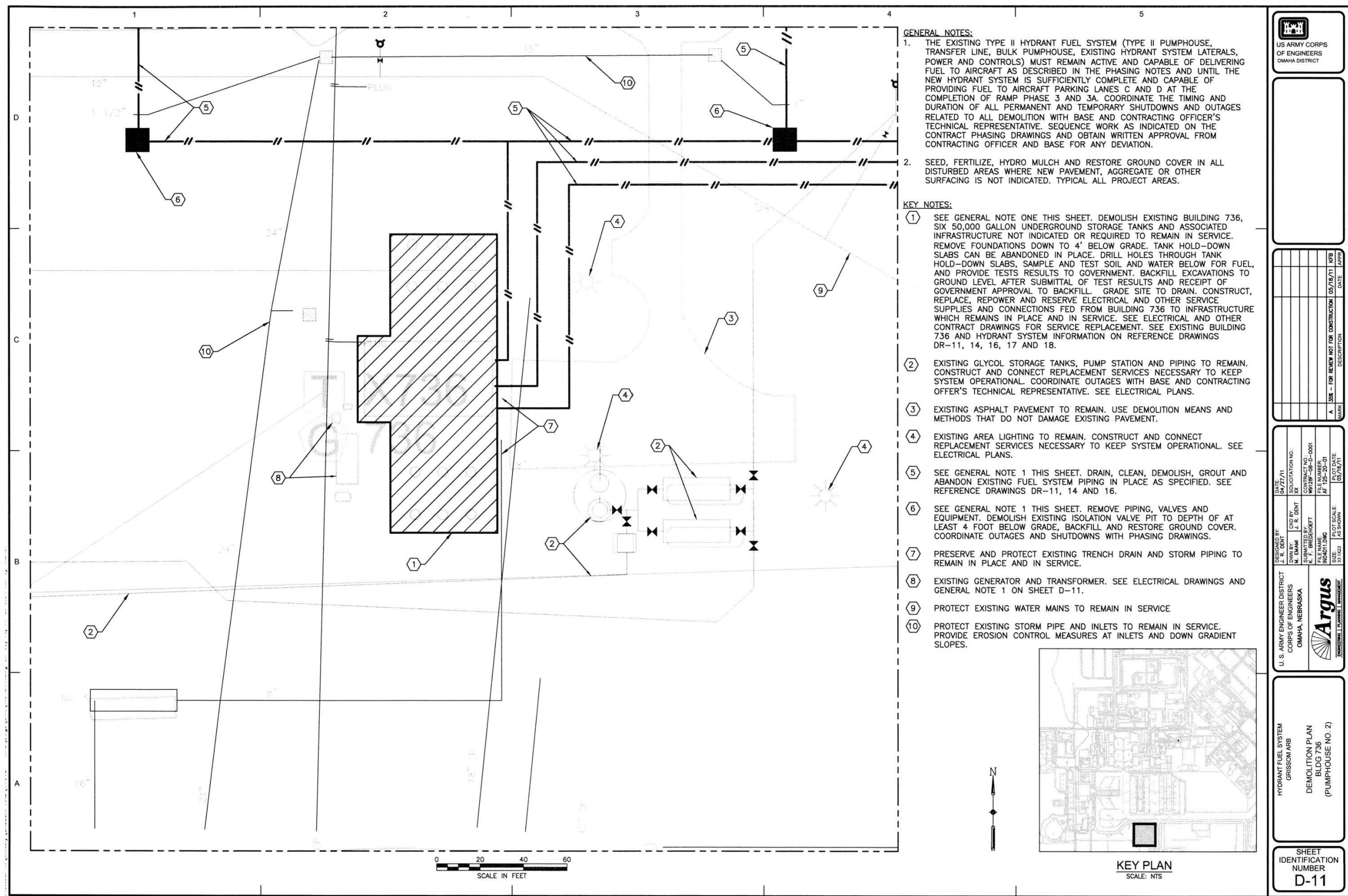
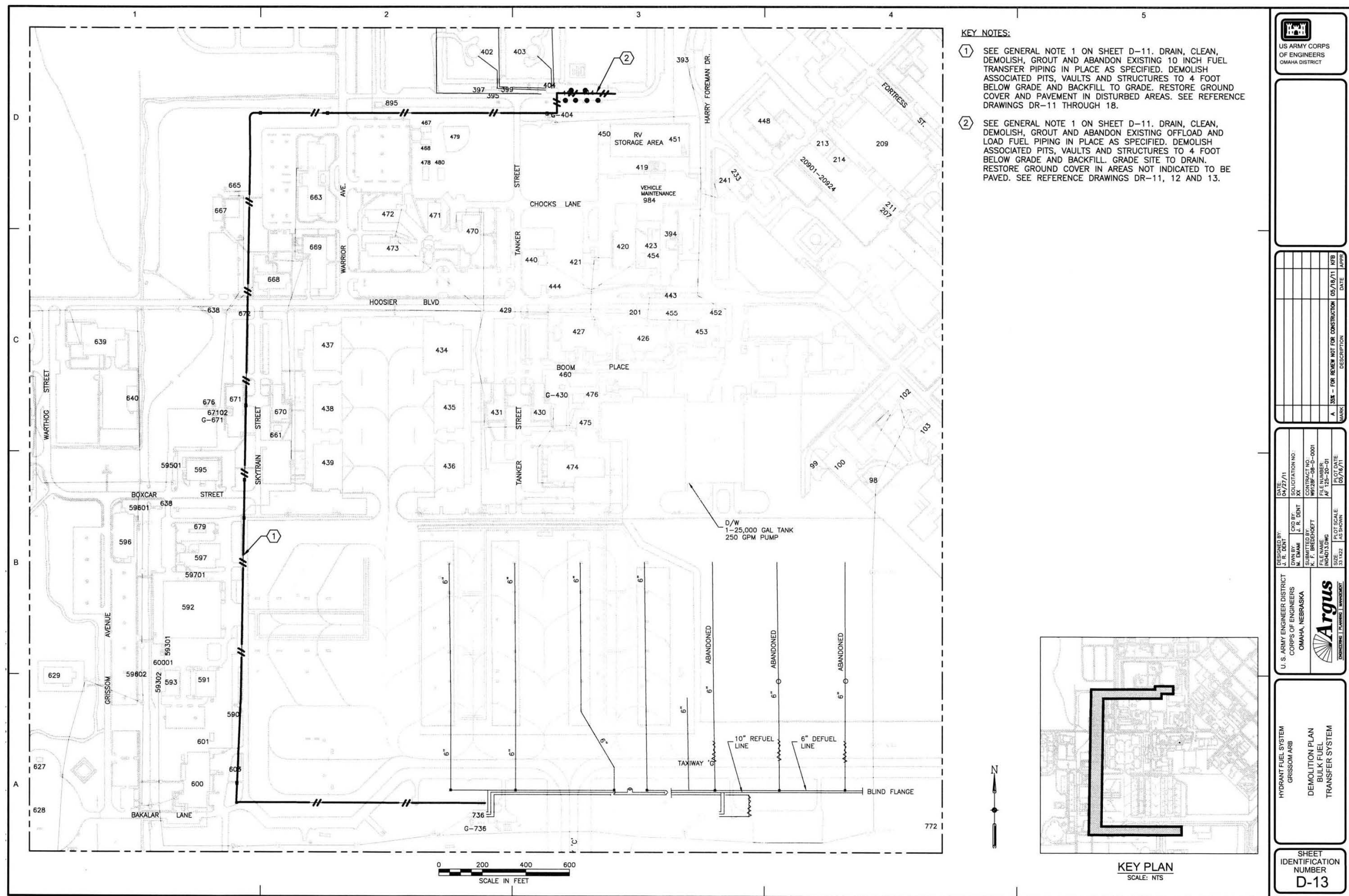
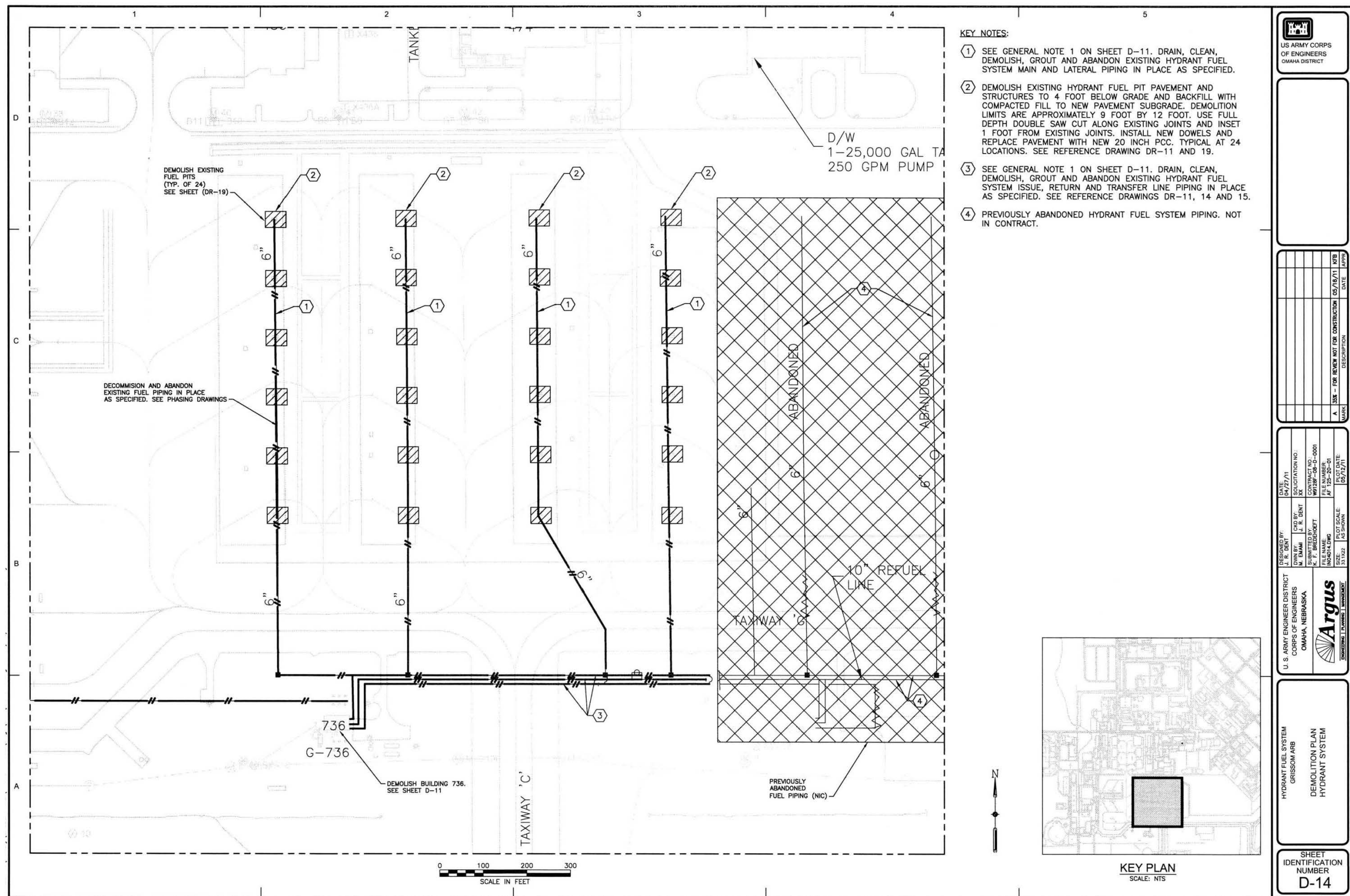
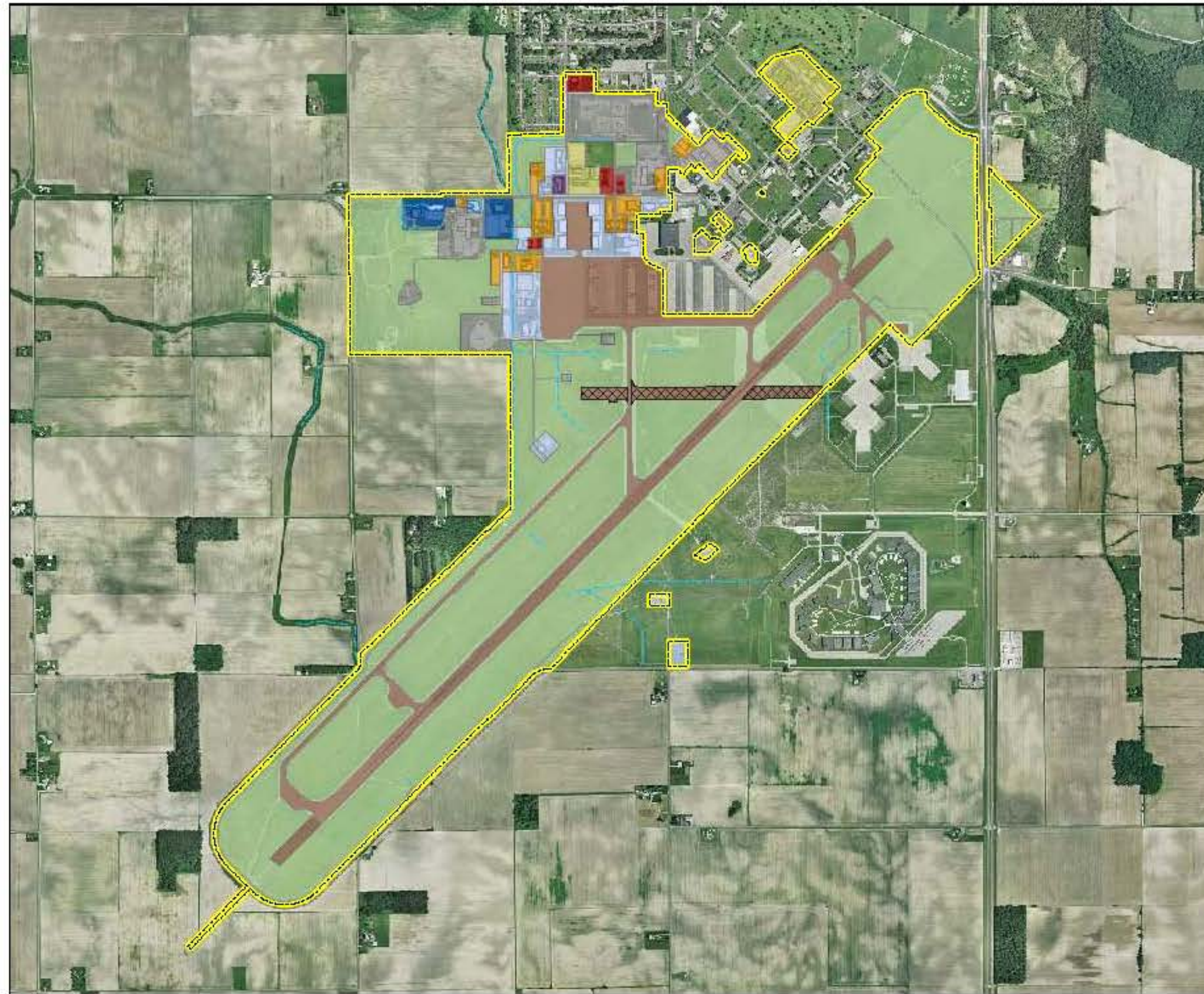


Figure 8 Hydrant Area, Pumphouse 736, Demolition Plan

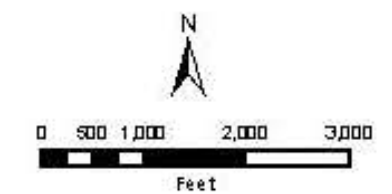






Legend

- Installation Boundary
- Water
- Abandoned Runway
- Administration
- Airfield Pavement
- Aircraft Operations/Maintenance
- Community Commercial
- Housing
- Industrial
- Medical
- Open Space
- Outdoor Recreation
- Tenant



Tab D.1
Existing Land Use Map
Grissom Air Reserve Base General Plan

Figure 11 Existing Land Use

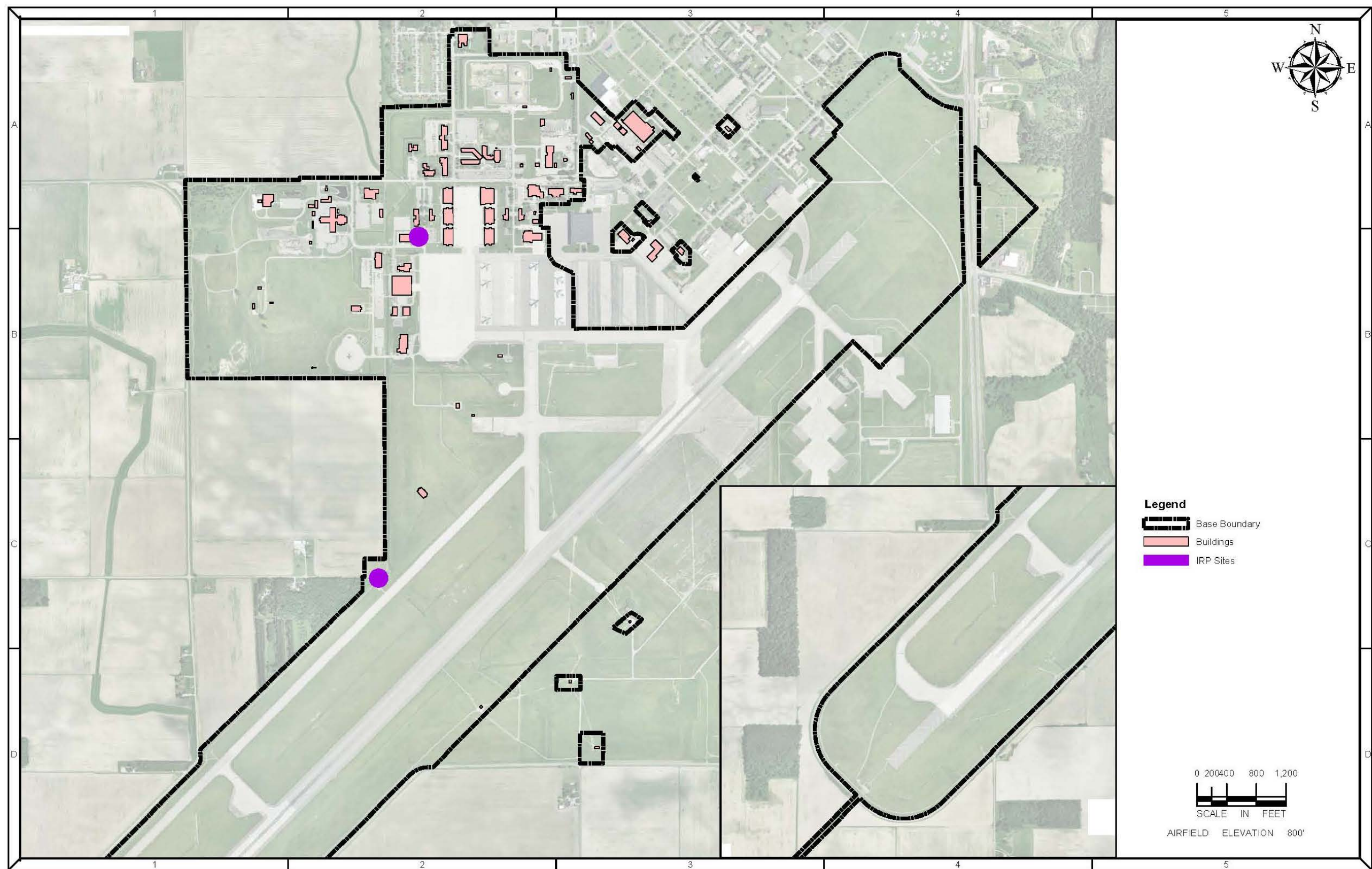


Figure 12 Active IRP Sites

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APPENDIX A

PHOTOGRAPHS OF PROPOSED PROJECT SITES



Flightline Location



POL Location

APPENDIX B

FEMA Flood Maps

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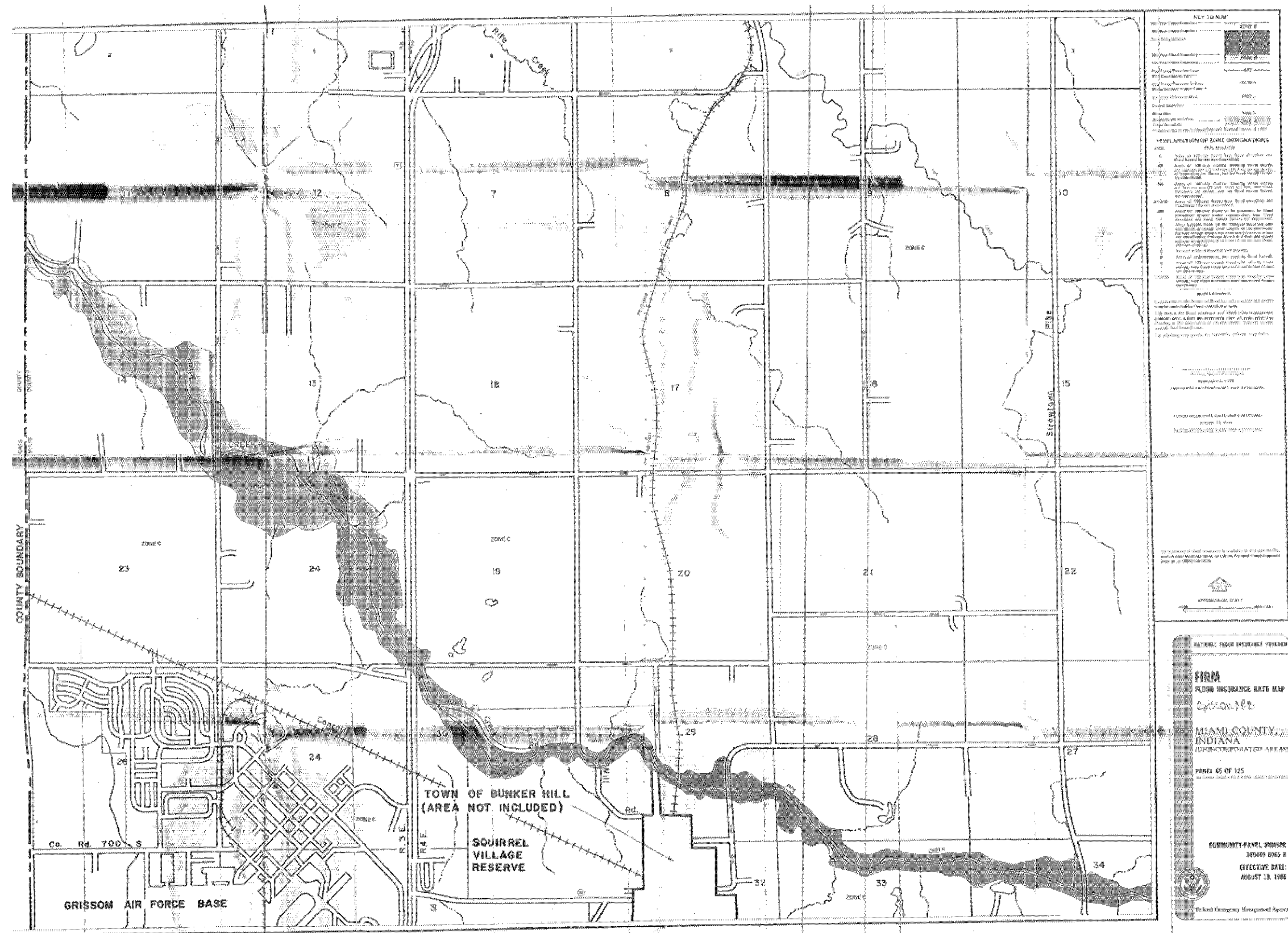


Figure 13 FEMA Map 1

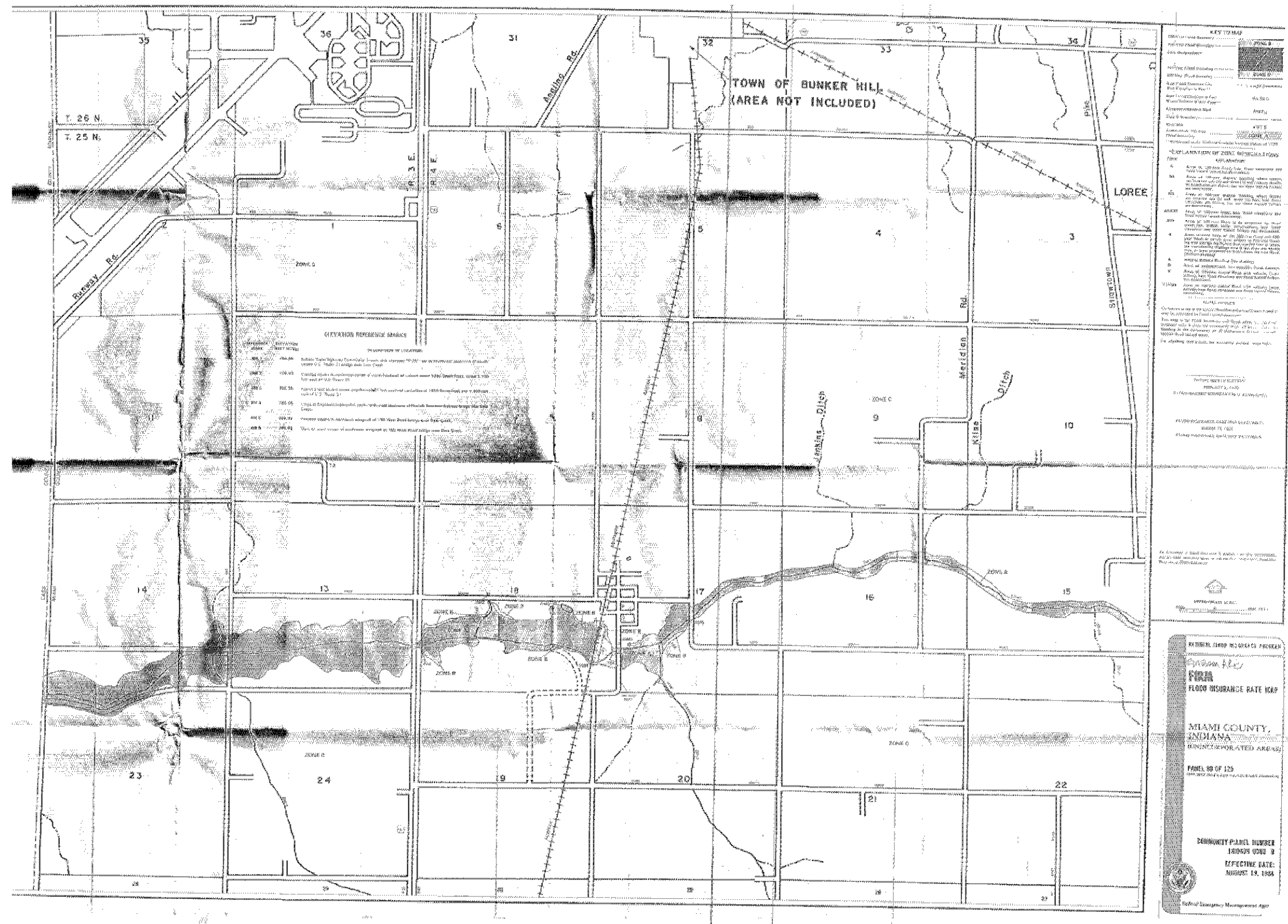


Figure 14 FEMA Map 2

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APPENDIX C

THREATENED & ENDANGERED SPECIES

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APPENDIX C-1

Miami County T&E Species

Indiana County Endangered, Threatened and Rare Species List

County: Miami

Species Name	Common Name	FED	STATE	GRANK	SRANK
Mollusk: Bivalvia (Mussels)					
Epioblasma triquetra	Snuffbox		SE	G3	S1
Lampsilis fasciola	Wavyrayed Lampmussel		SSC	G5	S3
Obovaria subrotunda	Round Hickorynut		SSC	G4	S1
Plethobasus cyphus	Sheepnose	C	SE	G3	S1
Pleurobema clava	Clubshell	LE	SE	G2	S1
Ptychobranhus fasciolaris	Kidneyshell		SSC	G4G5	S2
Quadrula cylindrica cylindrica	Rabbitsfoot	C	SE	G3G4T3	S1
Toxolasma lividus	Purple Lilliput		SSC	G3	S2
Venustaconcha ellipsiformis	Ellipse		SSC	G4	S2
Villosa fabalis	Rayed Bean	C	SSC	G2	S1
Fish					
Moxostoma valenciennesi	Greater Redhorse		SE	G4	S2
Reptile					
Emydoidea blandingii	Blanding's Turtle		SE	G4	S2
Thamnophis proximus proximus	Western Ribbon Snake		SSC	G5T5	S3
Bird					
Circus cyaneus	Northern Harrier		SE	G5	S2
Haliaeetus leucocephalus	Bald Eagle	LT,PDL	SE	G5	S2
Mammal					
Lynx rufus	Bobcat	No Status	SSC	G5	S1
Taxidea taxus	American Badger		SSC	G5	S2
Vascular Plant					
Crataegus succulenta	Fleshy Hawthorn		SR	G5	S2
Hypericum pyramidatum	Great St. John's-wort		ST	G4	S1
Napaea dioica	Glade Mallow		SR	G4	S2
High Quality Natural Community					
Forest - upland dry-mesic	Dry-mesic Upland Forest		SG	G4	S4
Forest - upland mesic	Mesic Upland Forest		SG	G3?	S3
Other					
Geomorphic - Nonglacial Erosional Feature - Water Fall and Cascade	Water Fall and Cascade			GNR	SNR

Indiana Natural Heritage Data Center
Division of Nature Preserves
Indiana Department of Natural Resources
This data is not the result of comprehensive county surveys.

Fed: LE = Endangered; LT = Threatened; C = candidate; PDL = proposed for delisting
State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SX = state extirpated; SG = state significant; WL = watch list
GRANK: Global Heritage Rank: G1 = critically imperiled globally; G2 = imperiled globally; G3 = rare or uncommon globally; G4 = widespread and abundant globally but with long term concerns; G5 = widespread and abundant globally; G? = unranked; GX = extinct; Q = uncertain rank; T = taxonomic subunit rank
SRANK: State Heritage Rank: S1 = critically imperiled in state; S2 = imperiled in state; S3 = rare or uncommon in state; G4 = widespread and abundant in state but with long term concern; SG = state significant; SH = historical in state; SX = state extirpated; B = breeding status; S? = unranked; SNR = unranked; SNA = nonbreeding status unranked

APPENDIX C-2

CASS COUNTY T&E SPECIES

Indiana County Endangered, Threatened and Rare Species List

County: Cass

Species Name	Common Name	FED	STATE	GRANK	SRANK
Mollusk: Bivalvia (Mussels)					
Cyprogenia stegaria	Eastern Fanshell Pearlymussel	LE	SE	G1Q	S1
Epioblasma torulosa rangiana	Northern Riffleshell	LE	SE	G2T2	SX
Epioblasma triquetra	Snuffbox		SE	G3	S1
Lampsilis fasciola	Wavyrayed Lampmussel		SSC	G5	S3
Obovaria subrotunda	Round Hickorynut		SSC	G4	S1
Plethobasus cyphus	Sheepnose	C	SE	G3	S1
Pleurobema clava	Clubshell	LE	SE	G2	S1
Pleurobema cordatum	Ohio Pigtoe		SSC	G4	S2
Ptychobranchus fasciolaris	Kidneyshell		SSC	G4G5	S2
Quadrula cylindrica cylindrica	Rabbitsfoot	C	SE	G3G4T3	S1
Toxolasma lividus	Purple Lilliput		SSC	G3	S2
Villosa fabalis	Rayed Bean	C	SSC	G2	S1
Villosa lienosa	Little Spectaclecase		SSC	G5	S3
Fish					
Etheostoma tippecanoe	Tippecanoe Darter		SSC	G3G4	S3
Moxostoma valenciennesi	Greater Redhorse		SE	G4	S2
Percina evides	Gilt Darter		SE	G4	S1
Amphibian					
Hemidactylium scutatum	Four-toed Salamander		SE	G5	S2
Reptile					
Clemmys guttata	Spotted Turtle		SE	G5	S2
Sistrurus catenatus catenatus	Eastern Massasauga	C	SE	G3G4T3T4Q	S2
Bird					
Haliaeetus leucocephalus	Bald Eagle	LT,PDL	SE	G5	S2
Tyto alba	Barn Owl		SE	G5	S2
Mammal					
Lutra canadensis	Northern River Otter		SSC	G5	S2
Lynx rufus	Bobcat	No Status	SSC	G5	S1
Taxidea taxus	American Badger		SSC	G5	S2
Vascular Plant					
Arenaria stricta	Michaux's Stitchwort		SR	G5	S2
Armoracia aquatica	Lake Cress		SE	G4?	S1
Aster furcatus	Forked Aster		SR	G3	S2
Carex sparganioides var. cephaloidea	Thinleaf Sedge		SE	G5	S2
Carex straminea	Straw Sedge		ST	G5	S2
Coeloglossum viride var. virescens	Long-bract Green Orchis		ST	G5T5	S2
Cypripedium calceolus var. parviflorum	Small Yellow Lady's-slipper		SR	G5	S2
Deschampsia cespitosa	Tufted Hairgrass		SR	G5	S2

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Indiana County Endangered, Threatened and Rare Species List

County: Cass

Species Name	Common Name	FED	STATE	GRANK	SRANK
<i>Eriophorum angustifolium</i>	Narrow-leaved Cotton-grass		SR	G5	S2
<i>Erysimum capitatum</i>	Prairie-rocket Wallflower		ST	G5	S2
<i>Festuca paradoxa</i>	Cluster Fescue		ST	G5	S1
<i>Juglans cinerea</i>	Butternut		WL	G4	S3
<i>Lemna minima</i>	Least Duckweed		SE	GNR	S1
<i>Matteuccia struthiopteris</i>	Ostrich Fern		SR	G5	S2
<i>Melanthium virginicum</i>	Virginia Bunchflower		SE	G5	S1
<i>Milium effusum</i>	Tall Millet-grass		SR	G5	S2
<i>Myriophyllum verticillatum</i>	Whorled Water-milfoil		SR	G5	S2
<i>Napaea dioica</i>	Glade Mallow		SR	G4	S2
<i>Oryzopsis racemosa</i>	Black-fruit Mountain-ricegrass		SR	G5	S2
<i>Panicum boreale</i>	Northern Witchgrass		SR	G5	S2
<i>Passiflora incarnata</i>	Purple Passion-flower		SR	G5	S2
<i>Rhynchospora macrostachya</i>	Tall Beaked-rush		SR	G4	S2
<i>Sanguisorba canadensis</i>	Canada Burnet		SE	G5	S1
<i>Satureja glabella</i> var. <i>angustifolia</i>	Calamint		SE	G5	S1
<i>Schizachne purpurascens</i>	Purple Oat		SE	G5	S1
<i>Scirpus purshianus</i>	Weakstalk Bulrush		SR	G4G5	S1
<i>Scutellaria parvula</i> var. <i>parvula</i>	Small Skullcap		SX	G4T4	SX
<i>Stenanthium gramineum</i>	Eastern Featherbells		ST	G4G5	S1
<i>Tofieldia glutinosa</i>	False Asphodel		SR	G4G5	S2
<i>Utricularia purpurea</i>	Purple Bladderwort		SR	G5	S2
<i>Valeriana edulis</i>	Hairy Valerian		SE	G5	S1
<i>Zigadenus elegans</i> var. <i>glaucus</i>	White Camas		SR	G5T4T5	S2
High Quality Natural Community					
Forest - floodplain mesic	Mesic Floodplain Forest		SG	G3?	S1
Primary - cliff limestone	Limestone Cliff		SG	GU	S1
Other					
Geomorphic - Nonglacial Erosional Feature - Water Fall and Cascade	Water Fall and Cascade			GNR	SNR

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